

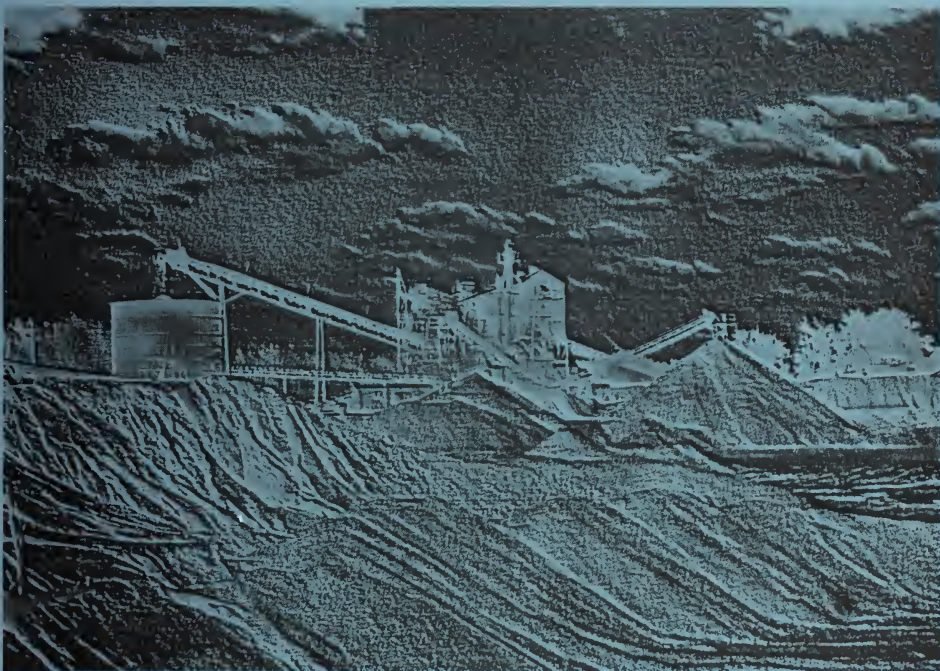
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Geol Survey

ILLINOIS MINERALS NOTE 70
March 1979

ILLINOIS MINERAL INDUSTRY IN 1976 and review of preliminary mineral production data for 1977

Irma Samson and Amy G. Dingwell





COVER: Photographic bas-relief of Illinois limestone-p.

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ILLINOIS MINERAL INDUSTRY IN 1976

and review of preliminary mineral production data for 1977

Irma Samson and Amy G. Dingwell

CONTENTS

ABSTRACT	1	Production	27
ILLINOIS MINERAL INDUSTRY	1	Other minerals	27
Mineral materials mined	4	Peat	27
Mineral materials processed	4	Gemstones	27
Mineral products manufactured	4	Primary barite	30
Employment and wages	4	Mineral materials processed	30
Transportation of minerals and mineral products	4	Ground barite	30
Consumption of minerals and energy in Illinois	4	Bismuth	30
INDIVIDUAL COMMODITIES	8	Columbium and tantalum	30
Mineral materials mined	8	Calcined gypsum	30
Fuels	8	Crude iodine	30
Coal	8	Iron oxide pigments	30
Production	8	Natural gas liquids	30
Employment and wages	9	Expanded perlite	30
Mine productivity	11	Pig iron and raw steel	31
Prices	11	Recovered elemental sulfur	31
Shipments	11	Exfoliated vermiculite	31
Transportation	11	Primary slab zinc	31
Consumption	15	Secondary slab zinc	31
Crude oil	16	Mineral products manufactured	31
Production	16	Cement	31
Refineries	18	Production	31
Substitute natural gas plants	18	Consumption	32
Consumption	19	Clay products	32
Natural gas	19	Coke	32
Production	19	Production	32
Consumption	20	Consumption and uses	32
Industrial and construction materials	21	Glass	32
Clays	21	Lime	32
Production	21	Production	32
Consumption and uses	21	Consumption and uses	32
Fluorspar	22	REVIEW OF PRELIMINARY MINERAL PRODUCTION	
Production	22	DATA FOR 1977	32
Shipments	22	Mineral materials mined	32
Consumption	22	Fuels	34
Sand and gravel	23	Coal	34
Production	23	Crude oil and natural gas	35
Transportation	25	Industrial and construction materials	36
Consumption and uses	25	Metals and other minerals	36
Stone	25	Mineral materials processed	36
Production	25	Mineral products manufactured	38
Shipment	25	FIGURES	
Consumption and uses	26	1. Illinois mineral production and mineral processing	
Tripoli (amorphous silica)	26	plants, by county, 1976.	1
Production	26	2. Total energy used in Illinois from 1957 through	
Consumption and uses	27	1976, by type of fuel or energy source.	10
Metals	27	3. Illinois coal production by county, 1976.	11
Zinc, lead, silver, and germanium	27		

4.	Trends in coal production in Illinois, 1955-1976.	14	25.	Illinois stone production by size of operation, 1975 and 1976.	29
5.	Trends in coal mine productivity, 1964-1975.	16	26.	Uses of crushed and broken stone produced in Illinois, 1976.	29
6.	Annual crude oil production in Illinois, 1905-1976.	19	27.	Production and commercial sales of peat in Illinois, 1970-1976.	29
7.	Consumption of natural gas in Illinois, 1970-1976.	20	28.	Production and value of cement manufactured in Illinois, 1975 and 1976.	33
8.	Trends in Illinois clay production, 1954-1976.	21	29.	Production and consumption of coke in Illinois, by use, 1972-1976.	33
9.	Illinois sand and gravel production by county, 1976.	23	30.	Quantity and value of coke and by-products produced, sold, or used by producer in Illinois, 1975 and 1976.	34
10.	Trends in production of sand and gravel in Illinois, 1954-1976.	23	31.	Preliminary mineral production data for 1977.	35
11.	Illinois stone production by county, 1976.	27	32.	Coal shipments from Illinois to consuming sectors in the U.S., 1976 and 1977.	36
12.	Trends in uses of crushed and broken stone produced in Illinois, 1954-1976.	27	33.	Coal shipments from Illinois to consuming states, 1976 and 1977.	36
13.	Production and consumption of finished portland cement in Illinois, 1963-1976.	33	34.	New coal mines announced or under construction in Illinois (as of August 1978).	37
14.	Production and consumption of prepared masonry cement in Illinois, 1963-1976.	33	35.	Expansion of existing coal mines announced in Illinois (as of August 1978).	37
15.	Trends in consumption of quicklime and hydrated lime in Illinois, 1963-1976.	35			

TABLES

1.	Production and value of mineral materials mined and/or processed and mineral products manufactured.	2
2.	Illinois mineral production, its value and percentage of U.S. mineral production, 1976.	3
3.	Value of mineral materials mined and/or processed and mineral products manufactured in Illinois, by county, 1976.	5
4.	Number of employees and average weekly earnings, hours worked, and hourly wages in Illinois mineral industry, 1975 and 1976.	7
5.	Selected mineral materials used in Illinois, 1975 and 1976.	7
6.	Fuels and energy consumed in Illinois, 1975 and 1976.	8
7.	Illinois coal production, by county, 1975 and 1976.	9
8.	Cumulative coal production in Illinois, by county, 1883-1976.	10
9.	Yearly production of Illinois surface mines, by county, 1911-1976.	12
10.	Coal mines, mining employees, average production, and average number of employees, by method of mining in Illinois, 1967-1976.	14
11.	Illinois coal production, by company, 1976.	15
12.	Illinois coal shipments, by state destination and consuming sector, 1972-1976.	16
13.	Shipment of coal for consumption in Illinois, by area of origin and consuming sector, 1972-1976.	17
14.	Cumulative crude oil production in Illinois, by county, 1888-1976.	18
15.	Illinois crude oil production, by major field, 1976.	18
16.	Consumption of major petroleum products in Illinois, 1972-1976.	19
17.	Production of natural gas in Illinois, 1972-1976.	20
18.	Production of natural gas in Illinois, by field and county, 1975 and 1976.	20
19.	Consumption of natural gas in Illinois, by consumer class, 1975 and 1976.	20
20.	Fluorspar shipments and consumption, Illinois, and U.S., 1967-1976.	22
21.	Sand and gravel produced and mode of transportation, by county, 1976.	24
22.	Illinois sand and gravel production, by size of operation, 1975 and 1976.	25
23.	Illinois sand and gravel sold or used by producer, by class of operation and use, 1975 and 1976.	26
24.	Production and value of Illinois stone, by county and mode of transportation, 1976.	28

ILLINOIS MINERAL INDUSTRY IN 1976

and review of preliminary mineral production data for 1977

Irma Samson and Amy G. Dingwell

ABSTRACT

The annual report of mineral production in Illinois summarizes the output and value of minerals mined in Illinois, as well as minerals processed and mineral products manufactured but not necessarily mined in Illinois. Illinois ranked twelfth among the states in value of mineral production in 1976, with a total value of \$2,961.4 million. The mineral materials mined had a total value of \$1,451.0 million, with the mineral fuels—coal, crude oil, and natural gas—contributing 82.2 percent of the total value. Processed mineral materials had a value of \$1,195.9 million, and mineral products manufactured totaled \$314.6 million in 1976. Illinois led the nation in the mining of fluorspar, tripoli, and stone and in the processing of expanded perlite.

Preliminary data indicate that the value of mineral materials mined in 1977 reached a new high of \$1,539.7 million in spite of decreases in the quantities of most materials mined.

Detailed production summaries and analyses—including maps, tables, and graphs—are given for all mineral commodities.

ILLINOIS MINERAL INDUSTRY

Three types of operations comprise the mineral industry in Illinois: the actual removal of mineral materials from the ground by mining or other means of extraction; the processing of crude mineral materials, the majority of which are mined outside of Illinois, into basic industrial raw materials; and the manufacturing of mineral products such as coke, lime, and cement from mineral materials, most of which are also extracted and processed in Illinois (fig. 1). The commodities in all three categories are listed in table 1, which gives their production and value from 1974 through 1976.

In 1976 the total value of output from the three types of operation of the Illinois mineral industry was \$2,961.4 million, an increase of 13.4 percent over 1975. The true value is actually higher than this figure indicates, since the figure does not include the values of some commodities for which specific information is unavailable (indicated on

table 1 by the symbol "NA"). Illinois ranked twelfth among the states in mineral production value in 1976, according to information from the U.S. Bureau of Mines. Illinois mineral production in 1976, by mineral commodity, and the state's percentage of the total national output are illustrated in table 2.

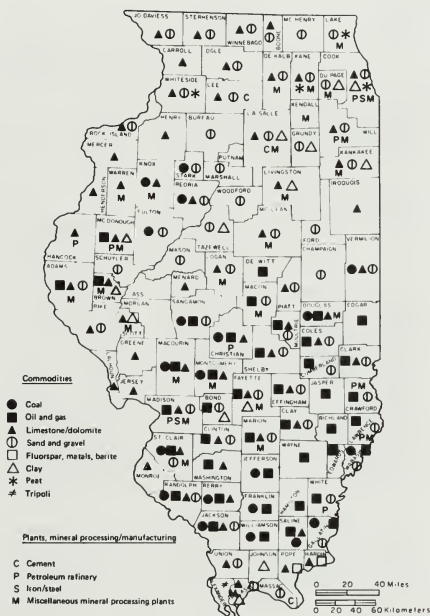


Figure 1. Illinois mineral production and mineral processing plants, by county, 1976.

TABLE 1—PRODUCTION AND VALUE OF MINERAL MATERIALS MINED AND/OR PROCESSED AND MINERAL PRODUCTS MANUFACTURED

Commodity	Unit	1976			1975			1974		
		Quantity	Value (\$1000)	Average unit value (\$)	Quantity	Value (\$1000)	Average unit value (\$)	Quantity	Value (\$1000)	Average unit value (\$)
MINERAL MATERIALS MINED										
FUELS										
Coal	thousand tons	58,136	\$ 924,365	\$ 15.90	59,539	\$ 871,651	\$ 14.64	58,073	\$ 580,726	\$ 10.00
Crude oil	thousand bbl	26,272	267,450	10.18	26,067	273,179	10.48	27,553	244,395	7.52
Natural gas	thousand Mcf	1,556	1,533	0.985	1,440	1,008	0.70	1,436	574	0.40
Natural gas liquids ^a	million bbl	NA ^b	NA	NA	NA ^b	NA	NA	NA	NA	NA
TOTAL ^c			\$1,193,348			\$1,145,837			\$ 825,695	
INDUSTRIAL AND CONSTRUCTION MATERIALS										
Clays										
Common	thousand tons	1,258	2,890	2.30	1,310	2,856	2.18	1,484	3,071	2.07
Refractory	thousand tons	51	382	7.50	57	393	6.94	103	673	6.56
Absorbent	thousand tons	W ^d	W	45.70	W ^d	W	W	W	W	W
Fluorspar (shipments)	tons	142,666	14,563	101.37	99,898	8,957	89.66	153,698	12,247	79.68
Sand and gravel										
Sand and gravel	thousand tons	34,299	61,759	1.80	34,600	59,964	1.73	40,621	59,828	1.47
Sand, industrial	thousand tons	4,485	25,393	5.66	4,400	23,551	5.35	2,084	8,738	4.19
Stone (limestone and dolomite)										
Crushed and broken	thousand tons	61,858	141,441	2.29	60,637	130,025	2.14	63,229	121,693	1.92
Dimension	tons	4,108	103	25.14	W	W	W	W	W	W
Tripoli (prepared)	thousand tons	W	W	W	W	W	W	W	W	W
TOTAL ^c			246,531			225,746			206,250	
METALS										
Lead	tons	W	W	W	1,068	459	429.78	493	222	450.30
Zinc	tons	W	W	W	W	W	W	4,104	2,947	718.08
Silver	troy ounces	W	W	W	W	W	W	W	W	W
Germanium		NA	NA	NA						
TOTAL ^c			W			459			3,169	
OTHERS										
Peat (sold)	thousand tons	87	763	8.76	96	1,511	15.79	96	1,412	14.74
Gem stones		NA	2	NA	NA	2	NA	NA	2	NA
Bariet, primary	thousand tons	W	W	W	W	W	W	W	W	W
TOTAL ^c			765			1,513			1,414	
Values that cannot be disclosed (W)										
			10,353				9,886		3,527	
Total value of mineral materials mined ^c			1,450,997				1,383,441		1,040,055	
MINERAL MATERIALS PROCESSED										
Natural gas liquids	thousand bbl	W	W	W	W	W	W	W	W	W
Mica, ground		W	W	W	W	W	W	W	W	W
Perlite, expanded	short tons	W	W	W	W	W	W	W	W	W
Barite, ground	short tons	W	2,345	W	W	W	W	W	W	W
Gypsum, calcined	short tons	W	W	W	W	W	W	W	W	W
Vermiculite, exfoliated	short tons	W	W	W	W	W	W	W	W	W
Iron oxide pigments	short tons	42,667	19,258	451.36	W	W	W	W	W	W
Bismuth		NA	NA	NA	NA	NA	NA	NA	NA	NA
Primary slab zinc		NA	NA	NA	NA	NA	NA	NA	NA	NA
Secondary slab zinc		NA	NA	NA	NA	NA	NA	NA	NA	NA
Columbium and tantalum		NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodine, crude	pounds	W	W	W	5,218	905,531	173.73	7,184	1,003,573	139.18
Pig iron	thousand tons	6,429	1,119,757	174.17						
TOTAL ^c			1,141,360				905,531		1,003,573	
Values that cannot be disclosed (W)										
			54,510				26,781		68,930	
Total value of mineral materials processed			1,195,870				932,312		1,072,503	
MINERAL PRODUCTS MANUFACTURED										
Cement (shipments)										
Portland	thousand tons	1,632	53,524	32.80	1,374	42,756	31.12	1,460	41,023	28.10
Masonry	thousand tons	74	4,356	58.57	69	3,658	53.01	69	3,228	46.68
Clay products, estimated			57,986		—	49,730	—	—	56,898	—

TABLE 1—continued

Commodity	Unit	1976			1975			1974		
		Quantity	Value (\$1000)	Average unit value (\$)	Quantity	Value (\$1000)	Average unit value (\$)	Quantity	Value (\$1000)	Average unit value (\$)
Lime	thousand tons	W	W	W	W	W	W	W	W	W
Sulfur ^e	long tons	W	W	W	W	W	W	W	W	W
Coke	thousand tons	1,706	160,961	94.35	1,924	168,619	87.64	1,912	125,694	65.74
Glass		NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL ^c			276,827			264,763			226,843	
Values that cannot be disclosed (W)			37,725			31,362			27,956	
Total value of mineral products manufactured			314,552			296,125			254,799	
STATE TOTAL ^c			\$2,961,419			\$2,611,877			\$2,367,357	

^aProduced in Illinois, according to the American Petroleum Institute.

^bNA = not available.

^cData may not add to totals shown due to independent rounding.

^dW = withheld to avoid disclosing individual company confidential data.

^eValues and amounts of sulfur processed are included with total of mineral products manufactured to avoid

disclosing individual company confidential data on line.

Source: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, Illinois State Geological Survey.

TABLE 2—ILLINOIS MINERAL PRODUCTION, ITS VALUE AND PERCENTAGE OF UNITED STATES MINERAL PRODUCTION, 1976

Commodity	Unit	Illinois		United States		Illinois percentage of United States Production	
		Quantity	Value (\$1000)	Quantity	Value (\$1000)	Quantity	Value
Fluorspar shipments	thousand tons	143	14,563	188	17,927	76.06	81.24
Peat, commercial sales	thousand tons	87	763	947	17,096	9.19	4.46
Coal	thousand tons	58,136	924,365	678,685	13,188,557	8.57	7.01
Pig iron	thousand tons	6,429	1,119,757	77,563	NA	8.29	—
Stone	thousand tons	61,862	141,544	901,660	2,221,000	6.86	6.37
Sand and gravel	thousand tons	38,784	87,152	885,156	1,774,030	4.38	4.91
Coke	thousand tons	1,706	160,961	58,333	5,020,857	2.92	3.21
Clays ^b	thousand tons	1,309	3,272	52,722	529,159	2.48	0.62
Zinc	thousand tons	W	W	485	358,900	—	—
Cement shipments	thousand tons	1,706	57,880	73,668	2,510,100	2.32	2.31
Crude oil	thousand bbl	26,272	267,450	2,976,180	24,229,540	0.88	1.10
Lead	thousand tons	W	W	610	NA	—	—
Natural gas liquids	thousand bbl	NA	NA	587,045	3,281,582	—	—
Natural gas	million cu ft	1,556	1,533	19,952,438	11,571,776	0.01	0.01
Lime	thousand tons	W	W	20,229	609,010	—	—

^aNA = not available.

^bExcluding fuller's earth.

^cW = withheld to avoid disclosing confidential data from individual companies.

Source: U.S. Bureau of Mines, Illinois State Geological Survey, Illinois Department of Mines and Minerals, and American Petroleum Institute.

Mineral materials mined

The 1976 value of commodities mined in Illinois was \$1,451.0 million, showing a 4.9 percent increase over the previous record high of \$1,383.4 million in 1975 (table 1). The mineral fuels—coal, crude oil, and natural gas—accounted for 82.2 percent of the 1976 total; industrial and construction materials—clays, fluorspar, sand and gravel, stone, and tripoli—added 17.5 percent; the metals—lead, zinc, silver—along with other minerals such as peat, barite, and gemstones made up the remaining 0.3 percent.

In 1976 Illinois led the nation in the production of fluorspar, tripoli, and stone. The state ranked third in the production of peat and fourth in output of coal, and sand and gravel. Extraction of mineral materials was reported by 99 of the state's 102 counties (table 3). Perry County, with the highest production value of any Illinois county, produced coal and crude oil at a total value of \$181.1 million, approximately 12.5 percent of the state total. Randolph County ranked second with a total value of \$119.7 million from coal, stone, crude oil, and sand and gravel.

Mineral materials processed

In 1976 sixteen Illinois counties processed raw mineral materials, mainly from other states (table 3). Minerals processed included pig iron, natural gas liquids, expanded perlite, sulfur, ground barite, calcined gypsum, exfoliated vermiculite, iron oxide pigments, crude iodine, bismuth, columbium and tantalum, and both primary and secondary slab zinc, with total value of \$1,195.9 million. Pig iron produced in Cook and Madison Counties contributed 92.6 percent of that total. The total, however, does not include the value of elemental sulfur recovered; its value is included with mineral products manufactured to avoid disclosing confidential data from individual companies.

Illinois led the nation again in 1976 in production of expanded perlite and ranked second in output of iron oxide pigments.

Mineral products manufactured

Mineral products manufactured in Illinois in 1976, primarily from materials mined within the state, included coke, clay products, cement, lime, and glass. Their combined value (plus sulfur processed as explained previously) was \$314.6 million, an increase of 6.2 percent over the \$296.1 million reported in 1975 (table 1). Coke accounted for 51.2 percent of the total value, clay products and cement for 18.4 percent each. No figures were available for the value of glass manufactured in Illinois.

Employment and wages

Illinois Department of Labor data indicate that the Illinois mineral industry employed 149,700 persons in

1976, including 25,800 in mining, quarrying, and oil and gas extraction; 75,300 in mineral processing; and 48,600 in manufacturing mineral products (table 4).

Average weekly earnings of workers in the mining sector of the Illinois mineral industry were \$312.52, an increase of 5.5 percent from average earnings in 1975. Average weekly earnings of bituminous coal miners, \$331.16, were the highest in the mineral industries. While mine employees' average earnings increased, the average number of hours worked per week declined slightly from 42.5 in 1975 to 42.1 in 1976. Table 4 gives more detailed information on employment in the mineral industry in Illinois for 1975 and 1976.

Transportation of minerals and mineral products

The shipment of mineral materials comprises a considerable part of the Illinois transportation industry. In 1976 more than 94 million tons of mineral materials were shipped by truck, and more than 54 million tons by railroad. Crushed stone comprised approximately 56 percent of the total tonnage shipped by truck, and sand and gravel about 35 percent. Coal comprised somewhat less than 90 percent of the railroad tonnage. Other materials such as pig iron, fluorspar, coke, and clay products were shipped by railroad, truck, and barge. Crude oil and natural gas were transported by pipeline, and minor amounts of coal were moved to mine-mouth generating plants by conveyor belt in Christian and Montgomery Counties.

Consumption of minerals and energy in Illinois

As a leading manufacturing state, Illinois consumes a large variety of mineral materials each year. Data for some of the mineral materials used in Illinois during 1975 and 1976 are shown in table 5.

On the average, Illinois consumption of mineral commodities is about 5.7 percent of the total consumed in the nation, approximately proportionate to its population, which, according to the U.S. Census Bureau, comprises 5.3 percent of the national total.

In 1976 Illinois consumed an estimated 3,687.9 trillion Btu of energy, or 5.36 percent of the total energy consumed in the United States (table 6). A large part—92.3 percent—came from fossil fuels. In 1975, Illinois energy consumption was estimated at 3,505.5 trillion Btu, or 5.37 percent of the U.S. total.

Trends in total energy used in Illinois are shown in figure 2. In spite of an increase in total energy consumption in Illinois from 2,215 trillion Btu in 1957 to 3,688 trillion Btu in 1976, the role of coal as a source of energy has declined while that of natural gas and oil products has increased. This trend resumed in 1976 after a slight reversal in 1975, with coal accounting for only 24.7 percent

TABLE 3--VALUE OF MINERAL MATERIALS MINED AND/OR PROCESSED AND MINERAL PRODUCTS MANUFACTURED IN ILLINOIS, 1976, BY COUNTY

County	Approximate ^a rank based on total value	Mineral materials mined, in order of value	Value (\$1000)	Mineral materials processed, in order of value	Value (\$1000)	Mineral products manufactured, in order of value	Value (\$1000)	Total value (\$1000)
Adams	43	Stone; sand & gravel; crude oil	W	Iron oxide pigments	W	—	—	6,113
Alexander	59	Tripoli; sand & gravel	W	—	—	—	—	W
Bond	83	Crude oil; natural gas; clay; sand & gravel	W	—	—	—	—	W
Boone	86	Stone; sand & gravel	W	—	—	—	—	W
Brown	87	Stone; crude oil; clay	291	—	—	Clay products	W	W
Bureau	74	Sand & gravel	1,124	—	—	Clay products	W	W
Calhoun	97	Stone	W	—	—	—	—	W
Carroll	91	Stone	W	—	—	—	—	W
Cass	102	—	—	—	—	—	—	—
Champaign	80	Sand & gravel	943	—	—	—	—	943
Christian	23	Coal; crude oil; stone	W	—	—	—	—	W
Clark	61	Stone; crude oil ^c ; sand & gravel	2,254	—	—	—	—	2,254
Clay	29	Crude oil; stone; sand & gravel	W	—	—	—	—	W
Clinton	50	Crude oil; stone; sand & gravel	W	—	—	—	—	W
Coles	49	Crude oil; stone; natural gas; sand & gravel	W	—	—	—	—	W
Cook	7	Stone; sand & gravel; clay; peat	32,545	Pig iron ^d ; expanded perlite; sulfur ^e ; secondary slab zinc ^f ; bismuth ^g	W	Coked ^d ; lime; clay products	40,434	W
Crawford	31	Crude oil; sand & gravel	W	Sulfur ^e	e	—	W	12,273
Cumberland	52	Crude oil ^c ; sand & gravel	W	—	—	—	—	W
De Kalb	60	Stone; sand & gravel	W	Exfoliated vermicu- lite; expanded perlite	1,049	—	—	W
De Witt	70	Crude oil	1,492	—	—	—	—	1,492
Douglas	4	Coal; stone; crude oil	W	Natural gas liquids	W	—	—	86,911
Du Page	34	Sand & gravel; stone	W	Exfoliated vermiculite	W	Clay products; glass ^f	W	10,449
Edgar	78	Crude oil	1,060	—	—	—	—	1,060
Edwards	45	Crude oil	5,647	—	—	—	—	5,647
Effingham	62	Crude oil; sand & gravel; stone	W	—	—	—	—	W
Fayette	22	Crude oil; stone; clay; sand & gravel	25,844	Sulfur ^e	e	Clay products	W	W
Ford	88	Sand & gravel; stone	W	—	—	—	—	W
Franklin	5	Coal; crude oil	82,669	—	—	—	—	82,669
Fulton	11	Coal; sand & gravel	46,346	—	—	—	—	46,346
Gallatin	15	Coal; crude oil; sand & gravel; natural gas	W	—	—	—	—	W
Greene	81	Stone	W	—	—	—	—	W
Grundy	41	Sand & gravel; clay; stone	3,643	—	—	Clay products	W	W
Hamilton	47	Crude oil	5,238	—	—	—	—	5,238
Hancock	85	Stone	682	—	—	—	—	682
Hardin	27	Fluorspar; stone; zinc; primary barite; lead; silver; gemstones; germanium ^f	22,005	—	—	—	—	22,005
Henderson	75	Stone	W	—	—	—	—	W
Henry	84	Stone	W	—	—	—	—	W
Iroquois	93	Stone	W	—	—	—	—	W
Jackson	30	Coal; stone; crude oil; sand & gravel	12,887	—	—	—	—	12,887
Jasper	44	Crude oil	5,877	—	—	—	—	5,877
Jefferson	3	Coal; crude oil	89,416	—	—	—	—	89,416
Jersey	95	Stone	W	—	—	—	—	W
Jo Daviess	71	Sand & gravel; stone	1,415	—	—	—	—	1,415
Johnson	65	Stone	W	—	—	—	—	W
Kane	25	Sand & gravel; stone ^g ; peat	W	Iron oxide pigments	W	Clay products	W	21,864
Kankakee	33	Stone; clay; sand & gravel	10,592	Sulfur ^e	e	—	W	W
Kendall	76	Stone; sand & gravel	W	—	—	—	—	W
Knox	19	Coal; stone	W	—	—	Clay products	W	31,103
Lake	39	Sand & gravel; peat	W	Calcined gypsum, expanded perlite, crude iodine; columbium ^f	2,208	Clay products; glass ^e ; fiber- glass ^e	W	7,803
La Salle	8	Sand & gravel; stone; clay	32,868	—	—	Portland cement; clay products; glass ^e	W	W
Lawrence	16	Crude oil; sand & gravel	34,233	Sulfur ^e	e	—	W	W
Lee	26	Stone; sand & gravel	2,588	—	—	Portland cement; masonry cement	—	W
Livingston	36	Stone; clay	8,449	—	—	Clay products	W	W
Logan	67	Sand & gravel; stone	W	—	—	Glass	f	W
McDonough	69	Stone; crude oil; clay	1,526	—	—	—	—	1,526

TABLE 3—continued

County	Approximate ^a rank based on total value	Mineral materials mined, in order of value	Value (\$1000)	Mineral materials processed, in order of value	Value (\$1000)	Mineral products manufactured, in order of value	Value (\$1000)	Total value (\$1000)
McHenry	40	Sand & gravel	7,592	—	—	—	—	7,592
McLean	63	Sand & gravel	2,111	—	—	Fiberglass	f	2,111
Macoupin	64	Sand & gravel; crude oil	2,097	—	—	Glass	f	2,097
Madison	9	Coal; stone; crude oil	W	Exfoliated vermiculite	W	—	—	52,165
	38	Stone; crude oil; sand & gravel	5,137	Pig iron ^d ; sulfur ^e	d,e	Coke ^d ; clay products; glass ^f	3,939	9,076
Marion	20	Crude oil; stone; sand & gravel	W	Secondary slab zinc	f	Glass	f	W
Marshall	90	Sand & gravel	W	—	—	—	—	W
Mason	99	Sand & gravel	W	—	—	—	—	W
Massac	28	Sand & gravel	W	—	—	Portland cement; masonry cement	W	15,002
Menard	68	Stone	W	—	—	—	—	W
Mercer	94	Stone	W	—	—	—	—	W
Monroe	73	Stone; crude oil	1,349	—	—	—	—	1,349
Montgomery	12	Coal; stone; crude oil	45,705	—	—	Glass	f	45,705
Morgan	102	—	—	—	—	—	—	—
Moultrie	98	Crude oil; sand & gravel	W	—	—	—	—	W
Ogle	72	Stone; sand & gravel	W	—	—	—	—	W
Peoria	32	Coal; stone; sand & gravel	12,230	—	—	—	—	12,230
Perry	1	Coal; crude oil	181,096	—	—	—	—	181,096
Piatt	92	Sand & gravel	W	—	—	—	—	W
Pike	77	Stone; sand & gravel	W	—	—	—	—	W
Pope	54	Fluorspar ^h ; lead ^h ; zinc ^h ; silver ^h	g	—	—	—	—	g
Pulaski	35	Clay; stone; sand & gravel	5,627	—	—	Clay products	W	W
Putnam	102	—	—	—	—	—	—	—
Randolph	2	Coal; stone; crude oil; sand & gravel	119,668	—	—	—	—	119,668
Richland	37	Crude oil	9,773	—	—	—	—	9,773
Rock Island	53	Stone; sand & gravel	W	—	—	—	—	W
St. Clair	6	Coal; stone; crude oil; sand & gravel	W	Iron oxide pigments; primary slab zinc; ground barite	W	Glass	f	76,974
Saline	14	Coal; crude oil; natural gas	34,901	—	—	—	—	34,901
Sangamon	24	Coal; sand & gravel; crude oil	23,203	Iron oxide pigments	W	—	—	W
Schnuyler	96	Sand & gravel	W	—	—	—	—	W
Scott	82	Stone; clay	843	—	—	—	—	843
Snelby	79	Crude oil; sand & gravel; stone	W	—	—	—	—	W
Stark	51	Coal; sand & gravel	W	—	—	—	—	W
Stephenson	89	Stone; sand & gravel	620	—	—	—	—	620
Tazewell	55	Sand & gravel; clay	3,134	—	—	—	—	3,134
Union	56	Stone; sand & gravel	W	—	—	—	—	W
Vermilion	48	Stone; coal; sand & gravel	W	—	—	—	—	W
Wabash	13	Coal; crude oil; sand & gravel	40,098	—	—	—	—	40,098
Warren	46	Stone	W	—	—	Clay products	W	5,329
Washington	42	Crude oil; stone	6,240	—	—	—	—	6,240
Wayne	18	Crude oil	31,759	—	—	—	—	31,759
White	17	Crude oil; sand & gravel	32,080	—	—	—	—	32,080
Whiteside	66	Stone; peat; sand & gravel	1,981	—	—	—	—	1,981
Will	21	Stone; sand & gravel	14,471	Expanded perlite; sulfur ^g ; crude iodine	6,740	Clay products; glass ^f	5,569	26,780
Williamson	10	Coal; crude oil; natural gas	49,200	—	—	—	—	49,200
Winnebago	58	Stone; sand & gravel	2,655	—	—	—	—	2,655
Woodford	57	Sand and gravel	2,978	—	—	—	—	2,978
Undistributed		Crude oil; stone	7,751	Pig iron	1,119,757	Coke	160,961	1,288,469
Values that cannot be disclosed (W)			373,125		66,117		103,648	443,543
Total ¹			1,449,056		1,195,870		314,552	2,961,419

^aSince some values are not available by county, county ranking cannot be exact.

^bW = withheld to avoid disclosing confidential data from individual companies.

^cCrude oil value included with Cumberland County.

^dPig iron and coke not available by county.

^eSulfur values included with mineral products manufactured to avoid disclosing individual companies' confidential data on time.

^fValue unknown; not included in total.

^gIncluding dimension stone.

^hFluorspar and metals values included with Hardin County.

¹Data may not add to totals shown because figures have been rounded.

Source: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, and Illinois State Geological Survey.

TABLE 4—NUMBER OF EMPLOYEES AND AVERAGE WEEKLY EARNINGS, HOURS WORKED, AND HOURLY WAGES IN ILLINOIS MINERAL INDUSTRY, 1975 AND 1976

Class of employment	1976				1975			
	Number of employees (x 1000)	Average weekly earnings (\$)	Average number of hours worked per week	Average hourly earnings (\$)	Number of employees (x 1000)	Average weekly earnings (\$)	Average number of hours worked per week	Average hourly earnings (\$)
Mining	25.8	312.52	42.1	7.43	25.9	296.28	42.5	6.97
Bituminous coal	13.6	331.16	40.1	8.26	13.8	318.69	41.5	7.68
Oil and gas extraction	5.6	271.60	41.8	6.49	5.7	254.58	42.6	5.97
Other	6.6	280.76	47.0	5.97	6.5	253.06	45.1	5.62
Mineral processing								
Blast furnaces and basic steel	44.1	307.45	40.0	7.68	47.3	267.95	39.0	6.88
Primary metal industries	18.9	245.27	40.9	6.00	20.4	249.62	40.2	6.21
Petroleum refining	12.3	337.20	42.3	7.98	12.5	297.87	41.1	7.25
Mineral product manufacturing								
Glass and glass products	12.8	248.88	40.5	6.15	12.5	234.94	41.3	5.69
Cement and clay products	4.1	210.65	40.8	5.16	4.0	181.82	39.1	4.66
Stone and other mineral products	15.5	246.98	41.6	5.93	18.4	224.38	41.0	5.48
Petroleum and coal products	16.2	316.76	42.7	7.42	16.4	297.87	41.1	7.25

Source: Illinois Department of Labor, Bureau of Employment Security.

TABLE 5—SELECTED MINERAL MATERIALS USED IN ILLINOIS, 1975 AND 1976

Commodity	Quantity unit	1976			1975		
		United States	Illinois	Illinois percentage of U.S. consumption	United States	Illinois	Illinois percentage of U.S. consumption
FUELS							
Coal	million tons	597.5	41.5	6.95	556.3	41.9	5.73
Coke	million tons	57.7	1.7	2.95	52.9	3.1	5.86
Distillate fuel oil	million bbl	1,150.9	58.9	5.11	1,043.7 ^a	52.1 ^a	4.99 ^a
Gasoline	million bbl	2,610.8	127.5	4.88	2,482.7	121.1	4.88
Kerosine	million bbl	62.6	1.5	2.40	58.0	2.7	4.66
Liquified petroleum gases and ethane	million bbl	514.0	23.5	4.57	486.4	19.3	3.97
Natural gas	trillion cu ft	20.8	1.2	5.77	20.4	1.1	5.39
Residual fuel oil	million bbl	1,025.1	24.5	2.39	898.6 ^a	26.9 ^a	2.99 ^a
METALS							
Pig iron	million tons	87.0	6.4	7.36	79.6	5.3	6.66
Lead	thousand tons	1,490.1	NA	NA	1,297.1	122.7	9.46
Zinc (slab)	thousand tons	1,134.1	NA	NA	924.6 ^a	123.1	13.31 ^a
CONSTRUCTION MATERIALS							
Air-cooled slag	million tons	22.9	NA	NA	22.2	NA	NA
Asphalt	million tons	27.3	1.8	6.59	27.5 ^a	1.8	6.55 ^a
Cement (portland)	million tons	72.6	3.8	5.18	68.7 ^a	3.3 ^a	4.77 ^a
Road oil	million tons	0.7	0.1	14.29	1.0	0.1	10.00
Sand and gravel	million tons	385.2	33.8	3.82	789.4	39.0	4.94
Stone	million tons	900.3	61.9	6.88	901.5	60.6	6.72
AGRICULTURAL & CHEMICAL MATERIALS							
Feldspar	thousand tons	739.7	NA	NA	669.9 ^a	NA	NA
Fluorspar	thousand tons	1,273.5			1,244.9	46.5	3.74
Lime ^c	thousand tons	20,257.0	1,007.5	4.97	19,364.0 ^a	877.1	4.53
Salt							
Evaporated	thousand tons	5,607.0	364.0	6.49	5,345.0	358.0	6.70
Rock	thousand tons	15,668.0	1,059.0	6.76	14,283.0	1,051.0	7.36

^aRevised.

^bNA = not available.

^cExcludes regenerated lime.

Source: U.S. Bureau of Mines.

TABLE 6—FUELS AND ENERGY CONSUMED IN ILLINOIS, 1975 AND 1976

Fuel	Units	1976	1975	Change from 1975-1976 (%)	Trillion Btu ^a	
					1976	1975
Coal	thousand tons	41,455	41,948 ^b	- 1.2	912.0	922.9 ^b
Natural gas	million cu ft	1,187,712	1,107,900	+ 7.2	1,224.5	1,142.2
Gasoline	thousand bbl	127,483	121,127	+ 5.2	669.0	635.7
Kerosine	thousand bbl	1,471	2,702 ^b	- 45.6	8.3	15.3 ^b
Distillate fuel oil	thousand bbl	58,877	52,103 ^b	+ 13.0	343.0	303.5 ^b
Residual fuel oil	thousand bbl	24,459	26,948 ^b	- 9.2	153.8	169.4 ^b
Liquid petroleum gases	thousand bbl	23,467	19,315	+ 21.5	94.1	77.5
Hydropower	thousand kilo- watt hr	111,645	103,722	+ 7.6	1.2	1.1
Nuclear power	million kilo- watt hr	26,455	22,305	+ 18.6	282.0	237.9
Total					3,687.9	3,505.5
Illinois percentage of United States total energy consumption					5.36	5.37
Percentage of total energy consumed in Illinois, by source:						
Coal					24.73	26.33
Natural gas					33.20	32.58
Oil products					34.39	34.27
Nuclear power					7.65	6.79
Hydropower					0.03	0.03
Total					100.00	100.00

^aFuel conversion factors: Coal—22,000,000 Btu/ton (@ 11,000 Btu/lb); Natural gas—1,031 Btu/Mcf; LPG—4,011,000 Btu/bbl; Gasoline—5,240,000 Btu/bbl; Kerosine—5,670,000 Btu/bbl; Distillate fuel oil—5,825,000 Btu/bbl; Residual fuel oil—6,287,000 Btu/bbl; Nuclear power—10,660 Btu/net kwh; Hydropower—10,478 Btu/kwh.

^bRevised

of Illinois' 1976 energy consumption as compared to 26.3 percent in 1975. The rapid growth of nuclear power since 1969 has partly replaced coal in the Illinois energy market. In fact, Illinois is a relatively heavy user of nuclear power, accounting for 13.8 percent of the nation's consumption of nuclear power in 1976.

INDIVIDUAL COMMODITIES

Mineral materials mined

The mineral materials mined in Illinois are categorized into four groups: fuels, industrial and construction materials, metals, and other materials.

Fuels

Coal

Production. Illinois once again ranked fourth, behind Kentucky, West Virginia, and Pennsylvania, among the nation's coal-producing states. Illinois producers mined

a total of 58.1 million tons of coal valued at \$924.4 million. This represents a 2.4 percent decrease in production from 1975, due mainly to wildcat strikes which plagued several mines throughout the year. Nonetheless, the total value of production in 1976 increased 6.1 percent as a result of the increase in the average f.o.b. mine value of coal from \$14.64 to \$15.90 per ton.

Coal was mined in 20 counties in 1976 (fig. 3). The ten leading counties—Perry, Randolph, Jefferson, Franklin, Macoupin, St. Clair, Williamson, Fulton, Douglas and Montgomery—together contributed 80.2 percent of the total production (table 7). Surface mines (sometimes called "strip mines") operated in 13 counties; however, in only three counties—Perry, Randolph, and Fulton—were more than 2 million tons of coal mined by the surface method. Underground mines operated in 13 counties, but only in six of them (Franklin, Jefferson, Macoupin, Douglas, St. Clair, and Montgomery) were more than 2 million tons mined by this method. In Perry County, the state's leading coal-producing county, all coal was surface mined.

A total of 4,617 million tons of coal has been produced from Illinois coal mines since 1833 (table 8). Of this total,

TABLE 7—ILLINOIS COAL PRODUCTION, BY COUNTY, 1975 AND 1976

County	No. of mines	1976 Production ^a			Value ^b	No. of mines	1975 Production ^a			Value ^b
		Underground (tons)	Surface (tons)	Total (tons)			Underground (tons)	Surface (tons)	Total (tons)	
Christian	1 ^c	1,296,475	—	1,296,475	20,613,953	1 ^c	1,716,782	—	1,716,782	25,133,688
Douglas	2	2,776,756	—	2,776,756	44,150,420	2	2,565,945	—	2,565,945	37,565,435
Franklin	3	4,927,675	—	4,927,675	78,350,033	3	5,033,520	—	5,033,520	73,690,733
Fulton	4	—	2,888,718	2,888,718	45,930,616	4	—	2,638,130	2,638,130	38,622,223
Gallatin	2	1,324,826	527,064	1,851,890	29,445,051	2	1,510,853	494,723	2,005,576	29,361,633
Jackson	5	—	761,474	761,474	12,101,437	2	—	54,584	54,584	799,110
Jefferson	4	4,667,694	504,430	5,172,124	82,236,772	4	5,396,780	614,228	6,001,008	88,001,157
Johnson	—	—	—	—	—	1	—	1,100	1,100	16,104
Knox	1	—	1,534,248	1,534,248	24,394,543	1	—	1,333,554	1,333,554	19,523,230
Macoupin	2	3,257,007	—	3,257,007	51,786,411	1	2,866,991	—	2,866,991	41,972,748
Montgomery	1 ^c	2,645,953	—	2,645,953	42,070,653	1 ^c	2,726,020	—	2,726,020	39,908,933
Peoria	1	—	716,653	716,653	11,394,783	2	—	844,298	844,298	12,360,523
Perry	5	—	11,378,602	11,378,602	180,919,772	5	—	11,675,172	11,675,172	170,924,518
Randolph	7 ^d	1,977,913	5,425,092	7,403,005	117,707,780	5 ^d	1,891,584	6,345,031	8,236,615	120,584,044
St. Clair	2 ^d	2,086,644	448,825	3,135,469	49,853,957	2 ^d	2,847,815	620,033	3,467,848	50,769,295
Saline	5	1,097,751	962,888	2,060,639	32,764,160	6	1,028,057	996,743	2,024,800	29,643,072
Sangamon	—	1,120,115	—	1,120,115	17,809,829	—	1,462,614	—	1,462,614	21,412,669
Stark	1	—	298,319	298,319	4,743,272	1	—	267,030	267,030	3,909,319
Vermilion	1	—	79,058	79,058	1,257,022	1	—	15,416	15,416	225,690
Wabash	1	1,822,854	—	1,822,854	28,983,379	1	1,266,342	—	1,266,342	18,539,247
Williamson	14	1,310,033	1,699,077	3,009,110	47,844,849	12	1,566,780	1,758,894	3,325,674	48,678,867
Total	62	30,911,696	27,224,448	58,136,144	924,364,690	57	31,880,083	27,658,936	59,539,019	871,651,238
Total (%)		53.2	46.8				53.5	46.5		

^aProduction figures, Illinois State Department of Mines and Minerals, Annual Coal, Oil and Gas Report, 1975 and 1976.

^bValue calculated at an average of \$14.64 per ton for 1975 and \$15.90 for 1976.

^cOne mine operated at Junction of Christian, Montgomery, and Sangamon Counties.

^dTwo mines operated at Junction of Randolph and St. Clair Counties.

967.5 million tons, or 21 percent, has been surface mined, beginning with the state's first large-scale surface mining operation in Vermilion County in 1911 (table 9). Although extensive surface mining did not begin in Illinois until the mid 1920s, more than 25 counties have been surface mined for coal at some time during the last 65 years.

The number of coal mines operating in Illinois has been generally declining since the early 1950s, when there were more than 150 mines in the state. In 1976, however, only 62 mines—five more than in 1975—operated in Illinois. Of the 62 mines, 39 were surface mines and 23, underground mines. The 30.9 million tons produced from the 23 underground mines represented 53.2 percent of the total Illinois coal production (table 7). Since 1966 the amount of coal produced in Illinois by underground mining has been gradually increasing, whereas production from surface mining, while showing annual fluctuations, has been generally declining (fig. 4). In 1976 production from the 39 surface mines totaled 27.2 million tons, a 1.6 percent decrease from 1975 surface-mine production. This is nearly 27 percent below peak surface-mine production in Illinois in 1967 when 44 surface operations produced 37.1 million tons of coal. The primary factors responsible for this steady decline in surface-mine production in Illinois are the new, more stringent laws governing reclamation of surface mined land; the depletion of shallow, easily surface-minable coal deposits; the rising cost of Illinois farm land; and the rapid decline of Illinois surface-mine productivity.

The average production and average number of employees per mine for both underground and surface operations are shown in table 10. Average output per underground mine in 1976 was about 1.3 million tons, a decrease of 11.5 percent from the 1975 output. This is only the second decrease in average output at underground mines in more than ten years. The average output per surface mine also declined, for the fourth year in a row, by 9.1 percent. The average number of employees at both surface and underground mines decreased very slightly in 1976.

In 1976, 26 coal-mining companies operated in Illinois. Production from each company is shown in table 11. The four largest—Peabody Coal, Consolidated Coal, Freeman United Coal Mining, and AMAX Coal—jointly accounted for 56.98 percent of the coal mined in the state.

Employment and wages. According to the Illinois Department of Mines and Minerals, 14,788 person were working in Illinois coal mines in 1976—10,396 in underground-mining operations and 4,392 in surface-mine operations. By comparison, in 1975, just 13,646 persons were employed—9,549 in underground operations and 7,097 in surface operations. The number of employees per mine is higher in Illinois than in any other leading coal-producing state. In addition, about 96 percent of Illinois' coal output is produced by United Mine Workers (UMW) members.

The Illinois Department of Labor reported that the average hourly earnings for bituminous coal miners increased from \$7.68 in 1975 to \$8.26 in 1976 (table 4).

TABLE 8—CUMULATIVE COAL PRODUCTION IN ILLINOIS
BY COUNTY, 1883-1976

County	Cumulative production ^a (tons)	Years active	Last year active
Adams	341,924	26	1969
Bond	7,355,569	57	1942
Brown	65,347	40	1963
Bureau	53,823,055	80	1964
Calhoun	96,247	27	1912
Cass	212,477	53	1941
Christian	299,492,010	92	1976
Clark	4,482	2	1955
Clay	801	1	1963
Clinton	38,656,325	79	1960
Coles	198,832	6	1888
Crawford	45,400	16	1961
Douglas	21,868,815	31	1976
Edgar	915,698	41	1952
Effingham	796	1	1890
Franklin	596,331,724	78	1976
Fulton	294,251,479	95	1976
Gallatin	25,113,602	92	1976
Greene	693,191	84	1967
Grundy	44,494,989	91	1973
Hamilton	22,097	16	1905
Hancock	771,281	72	1958
Hardin	40	1	1890
Henry	22,910,053	84	1965
Jackson	98,298,484	95	1976
Jasper	23,739	11	1939
Jefferson	101,130,163	73	1976
Jersey	120,350	59	1951
Johnson	302,808	60	1975
Kankakee	8,858,008	45	1969
Knox	62,920,285	93	1976
La Salle	65,547,638	79	1960
Livingston	10,111,437	80	1961
Logan	14,533,376	84	1968
Macoupin	11,000,468	65	1947
Macoupin	280,688,748	94	1976
McDonough	2,634,903	69	1951
McLean	5,544,139	47	1928
Madison	164,295,772	83	1964
Marion	39,247,722	82	1963
Marshall	12,516,141	70	1951
Menard	13,462,005	84	1965
Mercer	15,519,862	86	1973
Monroe	8,284	13	1941
Montgomery	137,078,899	95	1976
Morgan	190,787	64	1951
Moultrie	2,032,236	16	1924
Peoria	92,995,282	95	1976
Perry	308,893,139	95	1976
Pike	5,081	8	1942
Pope	23,747	14	1972
Putnam	10,071,893	29	1938
Randolph	141,664,906	95	1976
Richland	154	1	1890
Rock Island	3,846,169	67	1948
St. Clair	341,175,586	95	1976
Saline	247,459,518	95	1976
Sangamon	244,402,432	89	1976
Schuyler	7,747,691	84	1966
Scott	612,476	61	1942
Shelby	4,119,763	67	1950
Stark	9,459,149	86	1976
Tazewell	17,633,802	75	1956
Vermilion	165,051,447	95	1976
Wabash	4,069,271	40	1976

TABLE 8—continued

County	Cumulative production ^a (tons)	Years active	Last year active
Warren	685,466	73	1954
Washington	18,165,386	88	1969
White	1,676,741	36	1940
Will	44,265,271	93	1974
Williamson	417,943,721	95	1976
Woodford	7,810,160	70	1951
Total cumulative production 1882-1976	4,543,610,839		
Estimated production, all counties, 1833-1881	73,386,123		
Total cumulative production, 1833-1976	4,616,996,962		

Production figures: Illinois State Department of Mines and Minerals, Annual Coal, Oil and Gas Report, 1975.

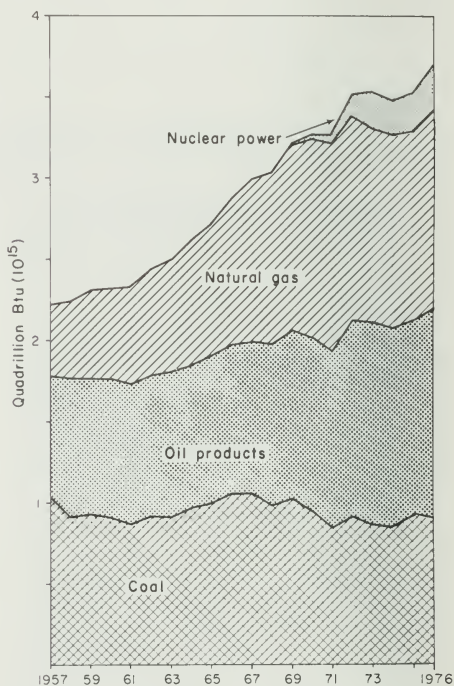


Figure 2. Total energy used in Illinois from 1957 through 1976, by type of fuel or energy source. Contribution of hydropower is too small to show. Although nuclear power has been used since 1960, its contribution prior to 1969 was too small to show.

TABLE 2—YEARLY PRODUCTION OF ILLINOIS SURFACE MINES, BY COUNTY,
IN MAJOR TOTAL PRODUCING COUNTIES (1911-1976)

(tons)

Year	Vermillion	Perry	Williamson	Fulton	Saline	Gallatin	St. Clair	Edgar	La Salle	Livingston	Peoria
1911	45,153										
1912	53,762										
1913	117,790										
1914	131,520										
1915	195,436										
1916	344,372										
1917	419,475										
1918	498,347										
1919	393,894										
1920	459,434										
1921	523,035										
1922	546,970										
1923	855,411	124,824	5,501								
1924	624,783	112,110	219,039	60,741	171,845	181,442					
1925	1,294,946	567,367	767,019	858,592	714,000	349,657	24,177				
1926	499,152	558,139	598,246	822,129	748,729	200,279	—	155,937			
1927	501,475	426,049	328,036	740,083	612,726	81,635	—	50,525	16,881		
1928	595,581	1,036,593	365,338	753,693	938,797	85,890	—	403,357	24,345	5,170	4,347
1929	267,982	1,657,130	398,916	756,789	896,387	128,383	—	422,821	3,100	12,342	2,783
1930	420,441	2,251,321	181,535	985,249	805,337	192,365	—	275,320	—	—	1,223
1931	331,601	2,410,081	34,345	780,743	841,055	165,439	—	369,984	—	7,365	6,323
1932	368,793	26,708	766,417	803,506	288,375	—	—	252,950	—	13,973	15,298
1933	227,720	2,201,466	96,681	642,150	572,079	266,792	—	90,114	—	4,400	11,224
1934	45,459	2,249,823	132,490	959,633	612,785	269,549	—	63,130	—	38,463	5,666
1935	100,767	2,465,705	541,256	1,480,106	664,350	269,697	—	125,810	—	113,102	1,733
1936	145,632	2,525,377	722,585	2,099,901	656,713	456,367	—	422,340	—	223,899	679
1937	155,935	2,844,531	606,241	2,683,525	624,594	799,425	—	453,983	27,087	231,661	758
1938	173,533	2,390,450	531,600	2,540,397	683,949	724,460	—	476,358	53,210	157,737	1,298
1939	155,792	2,339,583	687,677	3,275,376	421,648	759,460	—	800,396	71,084	179,605	3,972
1940	214,573	2,670,853	769,944	3,596,456	615,721	821,406	—	996,946	11,535	207,379	8,395
1941	270,590	2,868,127	712,574	4,214,063	740,734	824,997	—	1,006,630	—	176,415	2,605
1942	241,346	3,004,203	781,911	5,403,833	515,930	581,558	—	1,056,028	—	172,252	1,013
1943	56,238	2,671,479	791,454	6,001,721	619,189	628,401	—	1,140,248	—	147,925	594
1944	39,431	2,785,605	859,068	6,373,429	584,815	571,256	—	1,069,697	—	120,330	2,899
1945	83,400	2,830,681	751,809	5,554,336	515,287	605,779	22,919	940,966	—	116,196	8,886
1946	48,595	2,692,000	875,786	5,193,195	493,527	699,629	—	1,018,397	—	81,988	6,509
1947	97,533	2,487,817	1,403,891	6,268,216	449,356	644,911	—	1,147,172	—	108,376	6,503
1948	116,001	2,798,729	1,388,073	5,432,690	456,066	672,890	—	1,028,870	—	86,746	6,013
1949	493,905	2,145,855	821,081	3,392,815	404,504	557,934	—	1,300,358	—	56,149	7,408
1950	609,844	2,984,828	1,084,065	5,121,666	715,178	355,888	—	1,556,902	—	23,730	7,267
1951	922,035	2,900,492	1,158,349	5,334,387	665,842	322,436	57,188	1,560,182	—	9,678	2,891
1952	361,935	2,433,861	1,276,425	4,949,856	630,875	353,944	—	1,563,533	—	9,766	2,771
1953	776,489	2,056,637	1,311,011	5,249,388	618,135	507,148	—	1,528,345	—	6,683	4,059
1954	747,357	1,569,974	1,758,653	4,881,920	612,028	599,555	—	1,291,807	—	3,945	4,164
1955	817,177	2,328,420	2,287,761	5,321,591	502,889	803,910	57,331	1,363,905	—	3,382	3,879
1956	930,447	2,658,984	2,306,054	5,299,457	591,153	1,092,129	135,981	1,616,061	—	5,134	3,434
1957	1,027,153	2,260,773	2,286,876	5,428,943	506,941	1,327,361	88,619	1,971,320	—	9,186	2,222
1958	1,046,049	2,237,483	2,324,402	4,650,345	503,035	1,451,938	67,772	3,151,653	—	3,684	746
1959	1,160,229	2,543,572	2,386,706	5,086,166	608,208	1,419,931	119,407	3,136,626	—	8,324	1,181
1960	1,057,868	2,826,912	2,281,946	5,211,640	676,494	1,726,103	19,007	3,321,250	—	885	143
1961	1,082,420	2,618,173	2,095,730	4,858,231	676,999	1,955,781	—	3,525,599	—	—	205
1962	1,051,208	3,167,191	2,005,188	5,116,307	945,118	2,108,338	473	3,691,779	—	—	1,474,845
1963	1,106,716	3,515,918	2,732,470	6,222,217	1,181,505	2,333,596	—	4,446,984	—	—	927,750
1964	1,066,248	4,051,589	2,667,134	8,389,797	1,254,133	2,518,494	6,087	4,304,263	—	—	1,123,331
1965	790,107	6,503,838	3,273,531	8,222,112	790,950	1,943,296	50,243	4,412,101	—	—	1,285,001
1966	784,136	8,761,000	3,114,535	8,512,881	586,620	1,121,015	59,724	5,726,502	—	—	1,413,197
1967	573,927	9,321,683	3,090,409	8,044,017	715,390	1,109,650	266,898	6,441,122	—	—	1,474,845
1968	785,682	9,108,725	2,582,102	7,281,188	259,003	1,077,020	395,702	6,458,462	—	—	1,742,922
1969	630,087	8,507,937	2,189,668	6,130,903	100,555	965,972	1,31,345	5,275,331	—	—	2,736,888
1970	884,873	8,389,306	2,558,562	6,080,343	134,486	1,519,116	749,481	5,348,524	—	—	2,696,913
1971	—	7,905,928	1,986,122	4,353,204	87,061	1,033,646	433,180	4,529,975	—	—	2,322,545
1972	—	11,177,355	2,186,593	4,375,307	142,238	1,212,613	646,244	4,996,866	—	—	2,514,313
1973	—	11,209,541	1,857,540	3,136,175	4,675	1,092,889	303,875	4,296,663	—	—	1,754,569
1974	—	11,147,544	1,576,172	2,570,009	66,324	1,191,801	274,486	4,599,887	—	—	1,081,700
1975	15,416	11,675,172	1,758,894	2,638,130	54,584	996,743	494,723	620,033	—	—	844,298
1976	79,058	11,378,602	1,699,077	2,888,718	761,474	962,888	527,064	448,825	—	—	716,653
County Total	30,317,803	211,813,898	73,304,745	217,439,184	30,635,572	44,993,207	5,931,566	106,252,837	207,242	2,345,878	139,091
28,181,619											

Source: Annual Coal, Oil and Gas Report, Illinois Department of Mines and Minerals.
Local and shipping mines through 1968, 1969 through 1976 shipping mines only.

a Includes production from counties not listed.

Will	Henry	Knox	Hancock	Schuyler	Grundy	Adams	Bureau	Jefferson	Randolph	Parkes	Clark	Barth	Stall
													4,183
													5,162
													117,130
													101,520
													99,408
													344,372
													419,475
													490,167
													393,994
													459,444
													520,035
													446,370
													465,736
													1,429,950
													4,722,597
													1,512,611
													2,757,410
													4,244,017
													5,250,509
													6,220,336
226,368													6,619,903
701,280	40,673	72											6,756,957
865,666	397,510	—											5,714,305
988,500	661,317	—	40	12,750									6,822,244
976,178	616,901	4,302	—	6,965	12,966								7,411,349
982,016	583,287	27,638	—	1,816									520,035
968,951	490,018	313	842	4,821	54,385	64	1,621	541					446,370
1,068,581	476,973	329	900	3,338	59,360	412	1,500	957					465,736
1,403,026	496,252	10,665	—	3,773	87,196	112	115	420	10,602				1,429,950
1,393,077	536,564	487,549	—	478	101,488	909	—	380	753,234				4,722,597
1,323,386	538,684	499,919	—	2,513	67,676	21,024	4,576	354	682,089				1,512,611
1,226,826	630,134	603,363	—	4,957	56,003	12,358	1,053	508	841,421				2,757,410
1,347,259	616,165	542,647	14,178	13,939	53,786	7,379	—	474	739,991				4,244,017
1,285,823	510,113	591,770	28,861	59,445	60,129	—	48	167	880,861				5,250,509
1,283,193	549,014	1,157,553	15,637	103,614	60,333	151	66,487	34	937,764				6,220,336
1,545,864	530,683	1,305,935	—	216,482	49,074	—	118,646	66	891,911				6,619,903
1,779,552	523,436	1,939,780	—	235,708	30,237	—	100,920	23	1,057,048				6,756,957
1,735,678	421,667	1,727,978	—	186,105	142,321	—	119,320	—	1,187,295				5,714,305
1,416,726	418,731	1,096,687	—	129,535	207,190	—	87,389	35	938,685				6,822,244
1,707,956	—	1,230,354	18,758	103,785	211,581	—	694,002	42	1,061,714				7,411,349
1,654,232	—	2,045,098	47,077	130,076	170,739	—	694,720	—	1,063,583				520,035
1,109,555	—	1,534,177	53,727	27,365	89,034	—	565,966	—	857,504				446,370
920,411	—	1,928,530	40,446	25,987	37,218	—	723,836	—	1,073,177	355,333			419,475
446,814	—	2,043,152	41,030	12,085	30,423	—	811,238	—	1,081,812	857,916			490,167
101,725	—	1,668,539	31,586	8,990	27,252	—	722,236	—	944,877	871,379			393,994
136,083	—	1,798,857	11,133	8,947	20,176	—	687,448	—	806,481	840,927			459,444
135,181	—	1,778,828	23,520	6,754	6,855	—	698,964	—	793,129	834,905			520,035
153,205	—	1,784,754	30,387	11,069	247,625	—	794,394	—	1,151,702	551,356			446,370
155,154	—	1,661,150	28,690	7,574	217,991	—	77,235	—	1,150,316	621,075			1,429,950
303,867	—	1,890,117	34,522	6,091	192,883	—	875,544	6,281	854,993	480,903			1,512,611
261,301	—	2,187,235	37,995	463,696	22,748	—	505,313	17,720	987,573	373,265			2,757,410
206,823	—	2,221,949	—	734,926	—	37,087	517,958	23,180	1,150,414	326,384			4,244,017
368,555	—	2,239,285	—	583,302	—	37,620	374,123	23,602	937,159	320,344	170,085		5,250,509
339,142	—	2,061,109	—	625,012	6,917	35,866	306,558	15,434	945,687	347,940	375,524		6,220,336
332,598	—	2,220,818	—	501,955	379,415	42,904	290,263	18,481	1,066,779	22,447	491,964		6,619,903
330,151	—	1,553,006	—	584,868	326,592	35,509	322,214	7,513	1,046,915	—	534,207		6,756,957
486,828	—	940,360	—	566,885	341,157	28,109	258,932	1,159	1,537,169	—	444,795		6,822,244
496,869	—	1,320,409	—	431,473	347,226	26,520	—	—	2,045,441	—	533,499		7,411,349
567,663	—	1,218,670	—	210,666	359,891	21,827	—	—	3,301,859	—	587,518		520,035
492,133	—	1,248,924	—	—	261,623	16,334	—	—	3,352,478	—	574,069		446,370
593,543	—	1,792,649	—	—	368,941	12,569	—	—	3,043,010	—	557,128		419,475
666,636	—	1,776,971	—	—	256,429	3,393	—	—	2,871,393	105,048	876,517		490,167
637,081	—	1,675,974	—	—	288,939	—	—	48,000	2,773,404	—	727,568		393,994
463,417	—	1,431,781	—	—	242,429	—	—	1,017,979	2,461,601	—	659,013		459,444
262,104	—	1,518,728	—	—	256,574	—	—	—	3,041,174	—	502,231		520,035
227,673	—	1,015,777	—	—	—	—	—	—	2,833,015	186,427	379,038		446,370
140,222	—	1,017,064	—	—	—	—	—	—	595,779	—	253,364		419,475
—	—	1,333,554	—	—	—	—	—	—	614,228	6,345,031	267,030		490,167
—	—	1,534,248	—	—	—	—	—	504,430	7,284,634	—	298,391		393,994
36,405,022	9,038,172	59,724,854	459,329	6,044,275	5,752,801	338,147	11,122,619	4,506,238	69,149,262	7,095,649	8,231,869	967,455,981	

TABLE 10—COAL MINES, MINING EMPLOYEES, AVERAGE PRODUCTION,
AND AVERAGE NUMBER OF EMPLOYEES, BY METHOD OF
MINING IN ILLINOIS, 1967-1976

Year	UNDERGROUND				SURFACE			
	No. of mines	No. of employees	Average output per mine (tons)	Average no. of employees per mine	No. of mines	No. of employees	Average output per mine (tons)	Average no. of employees per mine
1967	35	5,392	837,879	163	44	3,413	844,654	78
1968	36	6,028	724,568	167	33	3,510	1,092,535	106
1969	28	5,944	1,077,237	212	34	3,647	1,019,411	107
1970	29	6,785	1,090,192	233	35	3,429	950,530	98
1971	27	7,088	1,090,886	262	36	3,483	804,480	97
1972	26	7,870	1,219,838	303	33	3,367	1,024,412	102
1973	24	7,794	1,357,390	325	32	3,615	905,353	113
1974	23	8,718	1,352,353	379	32	3,749	842,767	117
1975	21	9,549	1,518,099	455	36	4,097	768,304	114
1976	23	10,396	1,343,987	452	39	4,392	698,063	113

Source: Illinois State Department of Mines and Minerals, Annual Coal, Oil and Gas Report, 1967-1976.

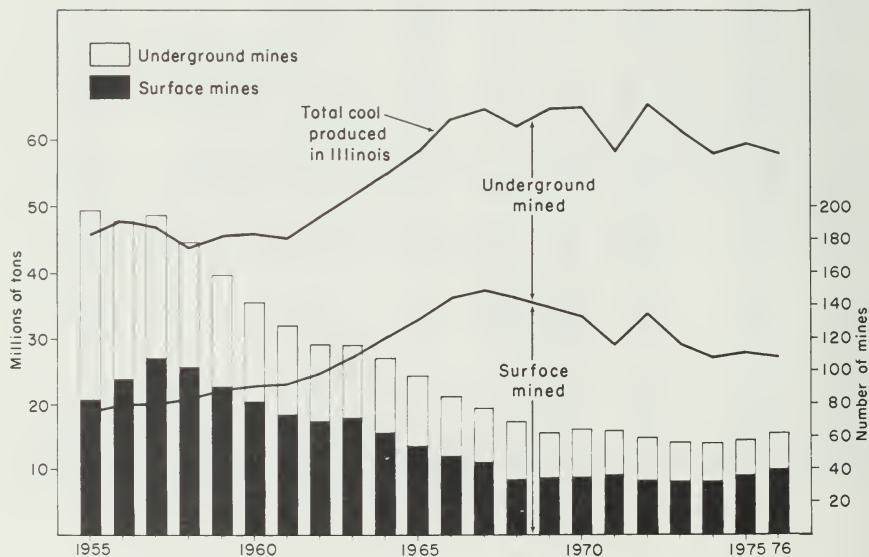


Figure 4. Trends in coal production in Illinois, 1955-1976.

TABLE 11—ILLINOIS COAL PRODUCTION, BY COMPANY, 1976

Rank	Company	No. of Mines		Production (tons)	Percentage of total production	No. of employees
		Underground	Surface			
1	Peabody Coal	4	4	12,897,637	22.19	3,405
2	Consolidated Coal	1	5	8,137,862	14.00	1,586
3	Freeman United Coal Mining	4	2	6,126,444	10.54	2,438
4	AMAX Coal	1	3	5,959,209	10.25	1,162
5	Southwestern Illinois Coal	0	2	4,989,525	8.58	508
6	Old Ben Coal	3	0	4,927,675	8.48	1,613
7	Zeigler Coal	5	0	4,107,390	7.07	1,396
8	Monterey Coal	1	0	2,780,421	4.78	550
9	Midland Coal	0	4	2,762,050	4.75	587
10	Sahara Coal	2	1	1,928,059	3.32	609
11	Inland Steel	1	0	1,894,893	3.26	613
12	Robertson & Associates	0	1	504,430	0.87	81
13	Three States Trucking	0	4	331,130	0.57	57
14	Williamson Coal	0	1	209,859	0.36	44
15	Jader Fuel	0	2	173,998	0.30	16
16	Lee Coal	0	1	79,058		7
17	Harrisburg Coal	1	0	73,047		40
18	Central States Mining	0	1	56,254		16
19	Pine Ridge Coal	0	1	54,058		24
20	E. & B. Coal	0	1	53,521	0.68	9
21	Brown Bros. Excavating	0	1	49,358		9
22	Cold Water Coal	0	1	21,506		4
23	Oxford Construction	0	1	8,332		2
24	D. D. Thomas	0	1	7,977		8
25	Malone	0	1	1,334		2
26	Illinois Coal, Oil & Gas	0	1	1,117		2
Totals		23	39	58,136,144	100.00	14,788 ^a

^a10,396 underground and 4,392 surface.

Source: Illinois State Department of Mines and Minerals, Annual Coal, Oil and Gas Report, 1976.

Tonnages of Illinois coal handled by specific railroads in 1976 are:

RAILROADS	TONS
Illinois Central Gulf Railroad Co.	14,701,169
Missouri Pacific Lines	9,393,067
Burlington Northern, Inc.	5,757,949
Chicago & Northwestern Transportation Co.	3,289,714
Conrail	3,234,219
Chicago & Eastern Illinois Railroad	2,918,278
Others	8,464,436
Total coal shipped by rail	47,758,832

Of the 13 railroads handling Illinois coal in 1976, the top three handled 62.5 percent of the total; the railroad which shipped the most Illinois coal, Illinois Central Gulf, handled 30.8 percent.

Consumption. Coal consumed in Illinois in 1976 total 41.5 million tons (table 13), 1.2 percent less than the amount consumed in 1975. The coal-consuming sectors included electric utilities (84.5 percent), coke and gas plants (6.6 percent), retail dealers (1.3 percent), and industrial and other users (7.6 percent).

Of the total 41.5 million tons of coal used in Illinois in 1976, 25.0 million tons, or 60.2 percent, were shipped from mines within the state. The amount of coal shipped from mines in Illinois for use in Illinois is steadily declining, mainly due to the replacement of Illinois coal in the utility market by low-sulfur western coals, and in the industrial market by low-sulfur Appalachian coal, natural gas, and fuel oil. In 1976, 28.7 percent of the total coal consumed in Illinois came from western states, primarily Colorado, Montana, Utah, and Wyoming. The amount of western coal shipped to Illinois has been rapidly increasing since about 1971 when extensive development of the western coal fields began.

Although Indiana, Kentucky, and West Virginia shipped coal into Illinois for use by electric utilities (table 13), of the total 35.0 million tons consumed by Illinois electric utilities in 1976, about 32.1 percent came from western states. The delivered cost of western coal, on an equivalent-heat basis, is higher (in some cases by a wide margin) than the cost of Illinois coal. For example, the average price paid for coal by electric utilities in Illinois in 1976 was \$0.79 per million Btu for Wyoming coal, \$1.09 per million Btu for Montana coal, and \$1.39 per million Btu for Colorado coal, as compared to \$0.72 per million Btu for Illinois coal. Nevertheless, the use of western coal by Illinois electric utilities is expected to increase until an economically

TABLE 12—ILLINOIS COAL SHIPMENTS, BY STATE DESTINATION
AND CONSUMING SECTOR, 1972-1976
(1000 tons)

Consuming sector	Wisconsin	Minnesota & Michigan	Iowa	Missouri	Indiana	Kentucky	Georgia & Florida	Other states ^a	Exports ^b and miscellaneous	Illinois	Total
Electric utilities											
1972	5,526	2,813	3,306	7,042	2,731 ^d	3,595	447 ^c	2,348 ^c	—	25,329	53,137
1973	4,599	2,254	2,714	8,014	2,167 ^d	2,923	763 ^c	2,129 ^c	51	24,091	49,705
1974	4,134	1,992	2,304	9,146	3,028 ^d	2,006	1,015	1,362	7	21,828	46,856
1975	4,595	2,013 ^d	2,290	10,496	3,081 ^d	1,982	987	1,834	—	22,006	49,284
1976	4,129	1,967 ^d	2,090	12,084	3,261	1,487	1,525	993	—	21,414	48,950
Coke and gas plants											
1972	—	—	—	—	2,810 ^d	—	—	—	182	1,288	4,280
1973	—	—	—	—	3,164 ^d	—	—	—	126	1,148	4,438
1974	—	—	—	—	3,361 ^d	—	—	—	237	1,054	4,652
1975	—	—	—	—	2,959 ^d	—	—	—	229	1,081	4,269
1976	—	—	—	—	2,536 ^d	—	—	—	43	982	3,561
Retail dealers											
1972	15	28	16	79	220	—	—	—	3	630	991
1973	2	17	14	168	43	—	—	—	2	417	663
1974	4	6	16	136	20	—	—	9	9	291	482
1975	1	—	7	100	14	—	—	—	12	196	330
1976	—	—	14	102	7	—	—	—	13	324	460
All others											
1972	793	377	1,130	1,553	492	—	—	—	14	4,084	8,443
1973	645	503	1,151	1,367	639	—	—	—	12	3,419	7,736
1974	556	491	867	1,464	513	—	—	23	29	3,193	7,113
1975	514	315 ^d	720	1,458	219	—	—	9	8	2,761	6,004
1976	534	265 ^d	735	1,486	276	—	—	—	7	2,252	5,555
Totals											
1972	6,334	3,218	4,452	8,674	6,253	3,595	447	2,348	199	31,331	66,851
1973	5,246	2,774	3,879	9,549	6,013	2,923	763	2,129	191	29,075	62,542
1974	4,694	2,489	3,187	10,748	6,922	2,006	1,015	1,394	282	26,366	59,103
1975	5,110	2,328	3,017	12,054	6,273	1,982	987	1,843	249	26,044	59,887
1976	4,663	2,232	2,839	13,672	6,080	1,487	1,525	993	63	24,972	58,526

^aIncludes AL (1971-1975), MS (1971-1976), TN (1971-1976), OH (1974), ND (1974), AR, LA, OK, and TX (1971).

^bPrimarily to Mexico and Canada.

^cIncludes minor amount of industrial and/or retail coal.

^dEstimated.

Source: U.S. Bureau of Mines Bituminous Coal and Lignite Distribution Quarterly, 1972-1976.

feasible, improved commercial technology to remove sulfur from Illinois coal is developed.

Approximately 36 percent of the coal used at coke and gas plants in Illinois in 1976 came from Illinois mines; 56.3 percent from mines in West Virginia and eastern Kentucky; and 6.5 percent from the western and western interior states of Arkansas, Oklahoma, Colorado, and Wyoming.

The amount of coal used for industrial and other purposes in Illinois continued to decline (table 13): the 3.2 million tons consumed in 1976 were 9.2 percent less than the amount consumed in 1975. The principal regions, excluding Illinois, that supplied coal for Illinois industrial use were West Virginia and eastern Kentucky and the western states.

Coal sold by Illinois retail dealers remained nearly the same in 1976 as in 1975. Illinois mines supplied 60.3 percent of the total 537,000 tons of Illinois retail coal, while West Virginia and Kentucky mines supplied 36.5 percent and western states supplied the remainder.

Crude oil

Production. Production of crude oil in Illinois in 1976

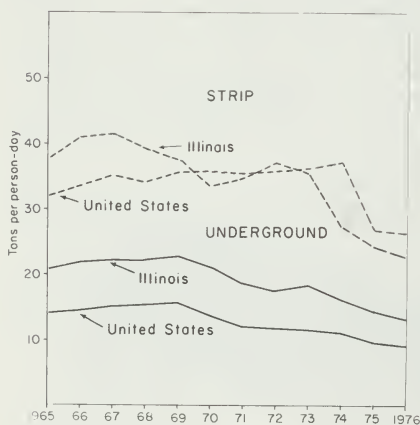


Figure 5. Trends in coal mine productivity, 1964-1975.

TABLE 13—SHIPMENT OF COAL FOR CONSUMPTION IN ILLINOIS,
BY AREA OF ORIGIN AND CONSUMING SECTOR, 1972-1976
(1000 tons)

Consuming sector	Illinois	Western Kentucky	Indiana	Ohio, eastern Pennsylvania, ^a and northern West Virginia	Southern West Virginia, ^b and eastern Kentucky	Western Interior ^c states	Western states ^d	Montana and Washington ^e	Total coal consumed in Illinois
Electric utilities									
1972	25,329	1,586	393 ^f	—	200	—	—	4,786 ^g	32,294
1973	24,091	1,662	385 ^f	—	142	30 ^f	13 ^f	6,142 ^g	32,465
1974	21,828	1,115	367	—	96	—	1,351 ^f	6,080 ^g	30,837
1975	22,006	844	371	—	174	90 ^f	1,906 ^f	9,462	34,853
1976	21,414	1,330	477	2 ^f	559	100 ^f	2,370 ^f	8,759	35,011
Coke & gas plants									
1972	1,288	—	—	—	1,955	—	—	—	3,243
1973	1,148	—	— ^f	8	1,812	^f	^f	—	2,968
1974	1,054	—	—	56	1,990	—	^f	—	3,100
1975	1,081	—	—	40	1,776	64 ^f	133 ^f	—	3,094
1976	982	—	—	35 ^f	1,541	47 ^f	130 ^f	—	2,735
Retail dealers									
1972	630	13	9	2	759	2	—	—	1,415
1973	417	6	— ^f	—	511	^f	^f	—	934
1974	291	3	—	—	419	3	56 ^f	—	772
1975	196	2	—	—	253	41 ^f	15 ^f	—	507
1976	324	3	—	2 ^f	191	7 ^f	10 ^f	—	537
All others									
1972	4,084	118	51	14	809	—	—	—	5,076
1973	3,419	111	40 ^f	9	638	37 ^f	7 ^f	—	4,261
1974	3,193	151	126	5	592	86	185 ^f	7 ^f	4,345
1975	2,761	55	15	3	481	40 ^f	235 ^f	4	3,494
1976	2,252	48	—	2 ^f	408	67 ^f	395 ^f	—	3,172
Total									
1972	31,331	1,717	453	16	3,723	2	—	4,786 ^g	42,028
1973	29,075	1,779	425	17	3,103	67	20	6,142 ^g	40,628
1974	26,366	1,269	493	61	3,097	89	1,592	6,087	39,054
1975	26,044	901	386	43	2,684	235	2,189	9,466	41,948
1976	24,972	1,381	477	41	2,699	221	2,905	8,759	41,455

^aIncludes Districts 1, 3, 4, and 6 (MD, OH, eastern PA, northern WV).

^bIncludes Districts 7, 8, and 13 (AL, GA, eastern KY, NC, TN, VA, southern WV).

^cIncludes Districts 14 and 15 (AR, KS, MO, OK, TX).

^dIncludes Districts 16, 17, 19-21 (CO, ID, NC, NM, SD, UT, WY).

^eIncludes Districts 22 and 23 (AK, MT, OR, WA).

^fEstimated; includes minor amounts of coal shipped to other consuming sectors.

^gIncludes coal produced in District 19 (WY and ID).

Source: U.S. Bureau of Mines, Bituminous Coal and Lignite Distribution, Calendar Years 1972-1976.

from 23,621 wells totaled 26.3 million barrels—0.8 percent more than in 1975. At an average unit value of \$10.18 per barrel, the production was valued at \$267.5 million (table 14). Of the 26.3 million barrels produced in 1976, 16.8 million barrels were produced by secondary-recovery methods (fig. 6), 16.6 million barrels by waterflooding, and 202,800 barrels by pressure-maintenance projects.

Forty-three counties produced crude oil in 1976, with the ten largest oil-producing counties contributing 76.4 percent of the state's oil production in 1976 as follows:

COUNTY	(%)	COUNTY	(%)
Lawrence	12.4	Clay	4.7
Wayne	11.9	Crawford	4.3
White	11.8	Wabash	4.1
Marion	11.4	Richland	3.7
Fayette	9.4	Jefferson	2.7

In 1976, although 383 oil fields were producing in

Illinois, 67.3 percent of the production came from the 10 fields listed in table 15. The southeastern Illinois area, which contains a number of fields, accounted for nearly 18 percent of the state's production. The four largest fields—Southeastern Illinois, Clay City Consolidated, Salem Consolidated, and Loudon—accounted for 51.6 percent of the crude-oil production in Illinois in 1976.

Trends in production of crude oil in Illinois are shown in figure 6. Crude-oil production reached a peak of 146.8 million barrels in Illinois in 1940. Since that time, oil production by primary-recovery methods has been on a more or less steady decline, with the exception of 1954-1956 when primary production temporarily increased. Illinois began producing significant amounts of crude oil by secondary-recovery methods, primarily waterflooding, in the early 1940s. Increased waterflood activity in conjunction with the introduction of the hydrofrac (hydraulic fracturing) method of well completion in 1954 reversed the downward trend of total oil production from 1954 through 1962. Since that time rates for both primary and

TABLE 14—CUMULATIVE CRUDE OIL PRODUCTION IN ILLINOIS, BY COUNTY, 1888-1976

County	Cumulative production, 1888-1976 ^a (1000 bbl)	1976 Production ^b (1000 bbl)	Percentage of total Illinois production	1976 Value ^c (in thousands)
Adams	118	3	0.0	33
Bond	7,295	48	0.2	492
Brown	236	3	0.0	29
Champaign	7	-	-	-
Christian	25,423	331	1.3	3,369
Clark-				
Cumberland	90,423	346	1.3	3,526
Clay	132,136	1,236	4.7	12,583
Clinton	83,876	416	1.6	4,238
Coles	22,993	184	0.7	1,874
Crawford	228,636	1,134	4.3	11,546
De Witt	2,879	147	0.6	1,492
Douglas	3,595	17	0.1	169
Edgar	3,689	104	0.4	1,060
Edwards	46,127	555	2.1	5,647
Effingham	15,951	211	0.8	2,144
Fayette	389,645	2,460	9.4	25,047
Franklin	70,808	424	1.6	4,319
Gallatin	50,101	462	1.7	4,702
Hamilton	131,873	515	2.0	5,238
Jackson	5	3	0.0	30
Jasper	50,868	577	2.2	5,877
Jefferson	82,136	705	2.7	7,179
Lawrence	389,492	3,253	12.4	33,118
Macon	919	15	0.1	156
Macoupin	253	7	0.0	69
Madison	17,280	94	0.3	953
Marion	406,129	2,990	11.4	30,441
McDonough-				
Hancock ^b	5,481	34	0.1	346
Monroe	3	1	0.0	7
Montgomery	119	1	0.0	8
Moultrie	99	2	0.0	22
Perry	795	17	0.1	176
Randolph	4,412	66	0.2	671
Richland	100,764	960	3.6	9,773
St. Clair	3,361	31	0.1	321
Saline	21,145	204	0.8	2,077
Sangamon	3,066	156	0.6	1,585
Schuyler	1	-	-	-
Shelby	1,666	46	0.2	471
Wabash	107,534	1,077	4.1	10,960
Washington	30,296	501	1.9	5,099
Wayne	239,622	3,120	11.9	31,759
White	279,402	3,108	11.8	31,641
Williamson	2,001	126	0.5	1,287
Other ^a	3,522	581	2.2	5,916
Total ^d	3,056,250	26,272	100.0	267,450

^a1976 production includes 581 thousand barrels which could not be assigned to individual fields or counties.

^bNo oil production reported for Hancock County in 1971-1976.

^cValue calculated at average price of \$10.18 per barrel.

^dDoes not add due to independent rounding.

Source: Illinois State Geological Survey Oil and Gas Section.

secondary production have declined steadily as reserves have been depleted. The extent of the depletion of reserves can be seen by comparing the January 1956 reserves figure of 701,300,000 barrels with the January 1977 figure of 155,318,000 barrels.

Refineries. According to the U.S. Bureau of Mines, 13 refineries were operating in Illinois as of January 1, 1977, with a total capacity of 1,188,900 barrels per calendar day—0.24 percent lower than the capacity of a year earlier.

TABLE 15—ILLINOIS CRUDE OIL PRODUCTION, BY MAJOR FIELD, 1976

Field	County	Crude oil production (1000 bbl)	Percentage of state total
Southeastern Illinois	Wabash Lawrence Crawford Clark Cumberland Jasper	4,717.5	18.0
Clay City Consolidated	Clay Wayne Richland Jasper	3,770.5	14.3
Salem Consolidated	Marion Jefferson	2,800.7	10.7
Louden	Fayette Effingham	2,254.1	8.6
New Harmony Consolidated	White Wabash Edwards	1,636.9	6.2
Sailor Springs Consolidated	Clay Jasper Effingham	684.0	2.6
Phillipstown Consolidated	White Edwards	601.6	2.3
Roland Consolidated	White Gallatin	508.4	1.9
Johnsonville Consolidated	Wayne	366.1	1.4
Oale Consolidated	Franklin Hamilton Saline	339.2	1.3
Subtotal		17,679.0	67.3
Others		8,593.2	32.7
Total		26,272.2	100.0

Source: Illinois State Geological Survey Oil and Gas Section.

During 1976, 372.9 million barrels of crude oil were received at Illinois refineries, including 228.5 million barrels from other states and 129.1 million barrels from foreign countries; the rest was of Illinois origin.

Substitute natural gas plants. Illinois contains 2 of the 13 producing substitute natural gas (SNG) plants in the nation. Only on SNG plant—Northern Illinois Gas Company's plant near Morris in Grundy County—operated in Illinois during 1975. In early 1976 People's Gas Light and Coke Company opened one of the nation's largest SNG plants, near Elwood in Will County. The two Illinois plants have a combined capacity of approximately 320 million cubic feet per day, and the Elwood plant is supplying 17 percent of People's Gas Company's current requirements for serving Chicago. Actual production figures are not available for either plant.

Northern Illinois Gas is reportedly considering expansion

TABLE 16—CONSUMPTION OF MAJOR PETROLEUM PRODUCTS IN ILLINOIS, 1972-1976

Product	Unit	1976	1975	1974	1973	1972
Gasoline (excluding naphtha)	thousand bbl	127,483 ^a	121,127 ^a	119,637 ^a	120,558 ^b	115,526 ^b
Kerosine ^c	thousand bbl	1,471	2,702 ^f	3,274	4,485	4,317
Distillate fuel oil ^c	thousand bbl	58,877	52,103 ^f	53,950	54,288	55,276
Residual fuel oil ^c	thousand bbl	24,459	26,948 ^f	28,521	28,795	29,581
Liquefied gases ^d	thousand gal					
Propane		973,325	800,697	724,708	650,115	644,123
Butane		12,080	10,344	9,413	9,597	7,176
Butane-propane mix		202	189	319	801	1,546
Total		985,607	811,230	734,440	660,513	652,845
Asphalt ^e	tons	1,820,897	1,830,462 ^f	1,792,502	2,096,879 ^f	1,565,675
Road oil ^e	tons	52,366	72,846	179,891	236,972	210,660

^aBasic Petroleum Data Book, American Petroleum Institute.

^bAmerican Petroleum Institute Weekly Statistical Bulletins.

^cU.S. Bureau of Mines Sales of Fuel Oil and Kerosine, Annual Statements, 1976-1975.

^dU.S. Bureau of Mines Sales of Liquefied Petroleum Gases and Ethane, Annual Statements, 1976-1975.

^eU.S. Bureau of Mines Sales of Asphalt, Annual Statements, 1976-1975.

^fRevised.

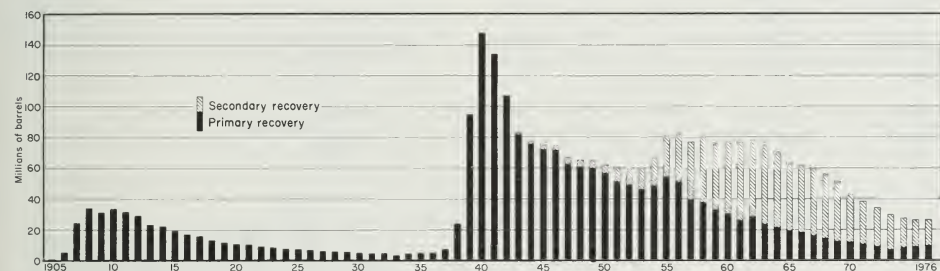


Figure 6. Annual crude oil production in Illinois, 1905-1976.

of its existing facilities. However, unless the Federal Energy Administration lifts its restrictions governing the allocation of petroleum feedstocks to SNG plants, the expansion may not be forthcoming.

Consumption. Consumption of major petroleum products in Illinois from 1972 through 1976 is shown in table 16. In 1976, gasoline consumption in Illinois increased by 5.25 percent over 1975 consumption and represented 4.88 percent of the total amount of gasoline consumed in the United States (table 5).

Consumption of distillate fuel oil increased 13.0 percent, while use of residual fuel oil decreased 9.2 percent.

In Illinois during 1976, consumption of kerosine decreased by 45.6 percent and consumption of liquefied gas increased 21.5 percent. The use of asphalt products in the state decreased by 0.5 percent, and consumption of road oil declined by 28.1 percent.

Natural Gas

Production. Natural gas is produced in Illinois from gas wells and oil wells; however, none of the gas from oil wells is marketed. The amount of gas produced from oil wells, too small to be shown in table 17, either is used for lease fuel in oil-producing operations or is flared at the well. In 1976, 1,556 million cubic feet of gas was marketed (table 17) at an average value of \$0.985 per thousand cubic feet (Mcf). The total value of the marketed gas is calculated to be \$1,533,074.

The amount of natural gas marketed from Illinois fields in 1976 increased by 8.1 percent over the 1975 level, continuing the growth in marketed natural gas that has prevailed in Illinois throughout the 1970s. For example, in 1970 only 198 million cubic feet were marketed, as compared to nearly 8 times that amount in 1976. The sharp rise in production results mainly from (1) new production

TABLE 17—PRODUCTION OF NATURAL GAS
IN ILLINOIS, 1972-1976

Year	Production (million cu ft)				
	Withdrawals			Disposition	
	From gas wells	From oil wells	Total	Marketed	Flared
1972	1,194	1,806	3,000	1,194	1,806
1973	1,638	— ^a	1,638	1,638	—
1974	1,436	— ^a	1,436	1,436	—
1975	1,440	— ^a	1,440	1,440	—
1976	1,556	— ^a	1,556	1,556	—

^aNot reported separately; included under gross withdrawals from gas wells.

Source: U.S. Bureau of Mines, Minerals Yearbooks, 1972-1976.

TABLE 18—PRODUCTION OF NATURAL GAS IN ILLINOIS
BY FIELD AND COUNTY, 1975 AND 1976

Gas field	County	Production (million cu ft)		Percentage of change 1975-1976
		1976	1975	
Eldorado Consol.	Saline	20.2	11.7	+72.6
Eldorado East	Saline	37.3	12.4	+200.8
	Gallatin			
Harco East	Saline	18.4	54.4	-66.2
Herold Consol.	Gallatin	4.8	4.8	—
Johnston City East	Williamson	55.3	7.6	+627.6
Mattoon	Coles	1,198.5	1,185.2	+1.1
Raleigh	Saline	18.3	17.7	+3.4
Raleigh South	Saline	—	34.6	—
Stirtz	Williamson	13.2	11.2	+17.9
Stubblefield South	Bond	190.5	100.0	+90.5
Total		1,556.4	1,439.6	8.1

Source: Illinois State Geological Survey Oil and Gas Section.

TABLE 19—CONSUMPTION OF NATURAL GAS IN ILLINOIS,
BY CONSUMER CLASS, 1975 AND 1976

Consumer class	1976	1975	Percentage of change	Percentage of total consumption
	Quantity (million cu ft)	Quantity (million cu ft)		
Residential	507,935	478,602	+ 6.1	42.7
Commercial	243,491	214,028	+ 13.8	20.5
Industrial	373,424	352,291	+ 6.0	31.4
Electric utilities	30,549	34,176	- 10.6	2.6
Other consumers ^a	3,168	1,690	+ 87.5	0.3
Total delivered to consumers	1,158,567	1,080,787	+ 7.2	97.5
Other uses ^b	29,145	27,113	+ 7.5	2.5
Total consumption	1,187,712	1,107,900	+ 7.2	100.0

^aIncludes municipalities and public authorities that use natural gas for institutional heating, street lighting, and other purposes.

^bIncludes lease and plant fuel, pipeline fuel, and extraction loss.

Source: U.S. Bureau of Mines.

from several rather large fields during the early 1970s, including Stirtz field in 1971, Mattoon field in 1972, and Eldorado Consolidated and Stubblefield South fields, both in 1975; (2) large increases in production from previously-producing fields such as Eldorado East and Johnston City East fields (table 18); and (3) the incentive of continuously-increasing wellhead prices.

At present, natural gas is being recovered in five counties—Coles, Bond, Saline, Williamson, and Gallatin (table 18). The leading fields include Mattoon in Coles County (77.0 percent of the total production), Stubblefield South in Bond County (12.2 percent), and Johnston City East in Williamson County (3.6 percent).

Consumption. In 1976, consumption of natural gas in Illinois rose to 1,187.7 billion cubic feet, an increase of 7.2 percent from the 1975 level of 1,107.9 billion cubic feet (table 19). The decline or 4.4 percent in consumption from the 1971 level, which can be seen in figure 7, reflects the decreasing supply and increasing price of natural gas rather than a diminished demand.

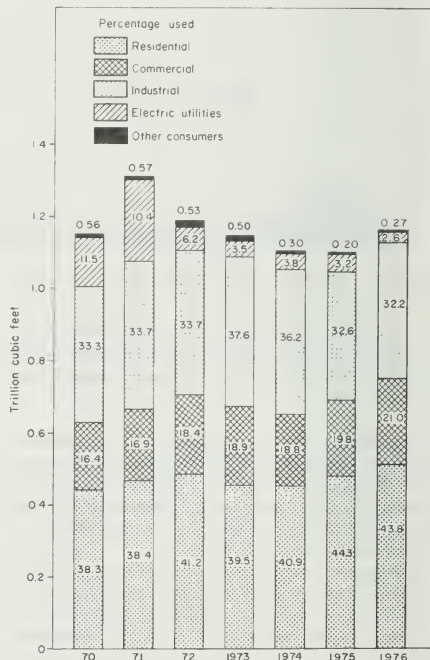


Figure 7. Consumption of natural gas in Illinois, 1970-1976.

In 1976, of the total 1,187.7 billion cubic feet of gas consumed in Illinois, 97.5 percent (1,158.6 billion cubic feet) was delivered to consumers, and the remaining 2.5 percent was lost in extraction, used for pipeline fuel, or burned as lease plant fuel. The consumption of natural gas by consumer class is shown in figure 6. Consumption increased in all sectors except electric utilities, where consumption was down 10.6 percent from the 1975 level.

Industrial and construction materials

Clays

Production. The types of clay mined in Illinois include common clay, refractory or fire clay, and absorbent clay (also referred to as fuller's earth). In 1976, a total of 1,309,019 short tons of clay, excluding fuller's earth, was produced in Illinois. Of this total, 96.1 percent was common clay and the rest was refractory clay. In addition, some absorbent clay—35.4 percent more than in 1975—was produced in Illinois in 1976. At an average-unit value of \$2.30 per ton for common clay and \$7.50 per ton for refractory clay, the common and refractory clays produced in Illinois were valued at \$3,271.7 thousand, approximately \$23,000 higher than the value reported in 1975.

Clay were mined in 12 Illinois counties, with the largest amount, 809,765 tons (57.0 percent), mined in La Salle County. As in 1975, 13 companies with 16 operations in eight counties produced common clay and shale. Refractory clay was mined by three companies in three counties. Pulaski County, which has two clay-mining companies, continued to be the only county to produce absorbent clay.

Trends in Illinois clay production are shown in figure 8. Although clay production tends to fluctuate widely from year to year depending on prevailing market conditions, production has been on a generally downward trend since 1968. This is not due to slack demand—demand for clays has continued at a high level along with increased construction activity—but rather to strong competition from out-of-state producers. Increased clay production and favorable transportation costs have enabled producers from southern states in particular to erode Illinois producers' markets. Consequently, in 1976, Illinois clay production fell to its lowest level in more than two decades.

Consumption and uses. The common clays and shales mined in Illinois are used principally in the manufacture of brick, sewer pipe, drain tile, cement, and light-weight aggregates. Of the 1.3 million tons of common clays produced in 1976, 328,788 tons (26.1 percent) were used in

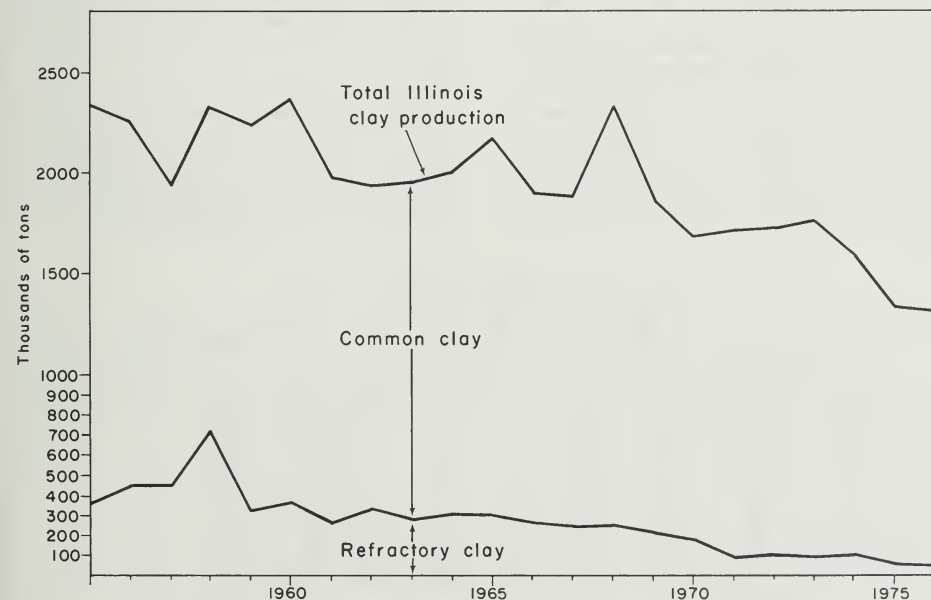


Figure 8. Trends in Illinois clay production, 1954-1976.

the production of common and face brick: 731,612 tons (58.2 percent) in the production of portland cement, structural concrete, and concrete blocks; 131,911 tons (10.5 percent) in the manufacture of sewer pipe and drain tile; and the remaining 65,825 tons (5.2 percent) in gypsum products, terra cotta, and highway surfacing.

In 1976, production of clays for common and face brick increased 21.2 percent from the 1975 production level, while production of clays for use in cement and concrete products declined 19.1 percent from the 1975 level.

In 1976, refractory clay produced in Illinois, used in the manufacture of refractory brick, stoneware, and other clay products, continued its decline to a new low of 50,883 tons in 1976.

Production of absorbent clay in Illinois increased by 36 percent in 1976—the second consecutive year in which absorbent-clay production has increased. Most of the absorbent clay produced in Illinois is used in animal litter and oil and grease absorbents.

Fluorspar

Production. Illinois began producing fluorspar, the state mineral, in 1842 and has continued to do so more or less continuously since that time.

In 1976, Illinois retained its position as the leading fluorspar-producing state, contributing 75.8 percent of the nation's total finished fluorspar shipments. Illinois produced 142,666 tons of finished fluorspar in 1976. Of the total shipped, 91,803 tons were acid grade (more than 97 percent calcium fluoride content) and 50,863 tons were of metallurgical grade (less than 85 percent calcium fluoride) (table 20). Included in these figures are minor amounts of ceramic grade fluorspar (85 to 96 percent calcium fluoride). Total fluorspar shipments from Illinois increased by 42.8 percent in 1976. The increase represents the resumption of

normal operations in 1976 after a 3-month long strike in 1975 which closed Ozark-Mahoning Company's mines and plants near Rosiclare.

All the fluorspar mined in Illinois in 1976 came from Hardin and Pope Counties. Fluorspar was mined and/or processed by four companies: Hastie Mining Company, Tamora Mining Company, Ozark-Mahoning Company, and the fluorspar division of Allied Chemical Company.

Shipments. The Illinois fluorspar industry has continued to be successful because of its convenient geographical location with respect to water, rail, and highway transportation. In 1976, Illinois producers shipped 7,271 tons of fluorspar, lead, and zinc ore to foreign countries and 153,841 tons to other states. The latter accounted for 86.8 percent of the total Illinois fluorspar, lead, and zinc shipments. The remainder—16,069 tons—was shipped to Illinois consumers.

Consumption. The reported consumption of fluorspar in the United States increased slightly from 1,244,938 tons in 1975 to 1,273,498 tons in 1976. The apparent U.S. consumption (production + imports - exports ± change in stocks) in 1976 totaled 1,120,970 tons—a decline of 13.8 percent from the 1975 level.

Illinois fluorspar consumption in 1976 was 44,462 tons or about 3.5 percent of the total U.S. consumption. This represents a continuation in the decline of Illinois fluorspar consumption in spite of the fact that Illinois raw steel production, in which fluorspar is used as a flux, totaled 11.0 million tons in 1976—up 15.5 percent from the 1975 level. The chemical industry is also a large consumer of fluorspar, using it in the production of hydrofluoric acid, and, ultimately, of fluorocarbons. But the growing concern over possible damage to the atmosphere which may be caused by fluorocarbons in aerosol sprays and refrigerants has depressed the fluorocarbon market for the past two years and will probably continue to do so in the future.

TABLE 20—FLUORSPAR SHIPMENTS AND CONSUMPTION, ILLINOIS AND UNITED STATES, 1967-1976

Year	Shipments (tons)				Illinois shipments as percentage of U.S. shipments	Consumption (tons)		
	Illinois acid grade	Illinois metallurgical grade	Total	United States total		Illinois	United States ^a	Illinois consumption as percentage of U.S. consumption
1967	120,388	89,819	210,207	295,643	71.1	60,521	1,091,158	5.55
1968	87,152	101,173	188,325	252,411	74.6	64,521	1,243,414	5.19
1969	47,776	40,704	88,480	182,567	48.5	78,727	1,356,624	5.80
1970	96,729	61,479	148,208	269,221	55.1	89,065	1,372,404	6.49
1971	72,514	65,537	138,051	272,071	50.7	89,971	1,344,742	6.69
1972	75,188	57,217	132,405	250,347	52.9	67,428	1,352,149	4.99
1973	93,062	72,751	165,813	248,601	66.7	86,715	1,351,705	6.42
1974	69,204	84,494	153,698	201,116	76.4	75,115	1,524,532	4.93
1975	50,479	49,419	99,898	139,913	71.4	46,525	1,244,938	3.74
1976	91,803	50,863	142,666	188,270	75.8	44,462	1,273,498	3.49

^aFluorspar consumed includes domestic and foreign material.

Source: U.S. Bureau of Mines.

Sand and Gravel

Production. Sand and gravel deposits are widely distributed throughout Illinois. The principal sources of commercial sand and gravel are glacial deposits, chiefly valley trains and outwash plains. In 1976, Illinois produced 15.6 million tons of sand (excluding industrial sand), 15.3 million tons of gravel, and 3.4 million tons of undifferentiated sand and gravel. At a value of \$1.80 per ton, Illinois sand and gravel production was valued at \$61.8 million, an increase of 3.0 percent in value from the 1975 level despite a decrease in tonnage (table 21).

The quantity of industrial sand produced in Illinois during 1976—reported from La Salle County only, although a plant was also operating in Ogle County—was 4.5 million tons, just 1.9 percent more than in 1975. At a unit value of \$5.66 per ton, the 1976 value of industrial sand was \$25.4 million (table 21).

Sand and gravel was produced in 61 counties in 1976 (fig. 9). The number of operations producing sand and gravel continued to decline, with 174 companies running 191 operations. Total sand and gravel production declined very slightly—by only 215,655 tons—from the 1975 level (fig. 10). Although the number of operations has declined over the past 15 years, the size of sand and gravel plants has been increasing. In 1976, 38 plants produced over 300,000 tons each (table 22) as compared to only 25 plants during the mid 1960s. Larger plants enable producers to take advantage of certain economies of scale.

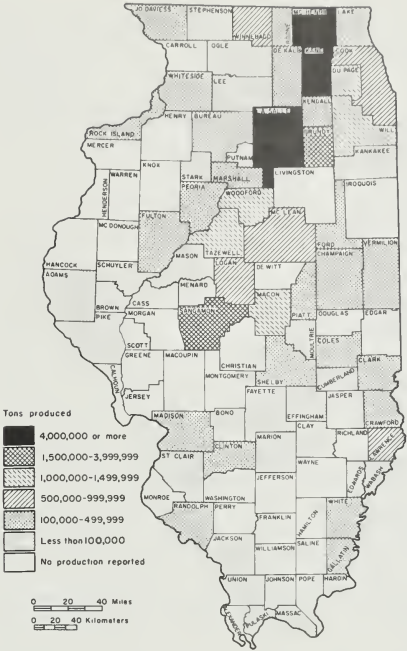


Figure 9. Illinois sand and gravel production by county, 1976. Source: U.S. Bureau of Mines.



Figure 10. Trends in production of sand and gravel in Illinois, 1954-1976.

TABLE 21—SAND AND GRAVEL PRODUCED AND MODE OF TRANSPORTATION,
BY COUNTY, 1976

County	Number of companies	Number of operations	Quantity (1000 tons)					Value (\$1000)	Mode of Shipment			
			Sand	Gravel	Industrial sand	Undifferentiated	Total produced		Truck	Rail	Barge	Undis-tributed
Adams	1	1	W ^a	—	—	—	W	W	W	—	—	—
Bond	1	1	—	—	—	—	W	W	W	—	—	—
Boone	4	4	W	W	—	—	219	324	219	—	—	—
Bureau	6	6	W	W	—	—	515	1,121	515	—	—	—
Champaign	3	3	W	W	—	—	498	943	498	—	—	—
Clark	3	4	W	W	—	—	368	638	368	—	—	—
Clay	1	1	W	W	—	—	W	W	W	—	—	—
Clinton	3	3	W	—	—	—	191	356	191	—	—	—
Coles	2	2	W	W	—	—	W	W	W	—	—	—
Cook	2	2	W	W	—	—	W	W	W	—	—	—
Crawford	1	1	W	W	—	—	W	W	W	—	—	—
Cumberland	2	2	W	W	—	—	W	W	W	—	—	—
De Kalb	4	4	210	W	—	—	259	519	W	—	—	W
Du Page	3	4	W	1,009	—	—	1,189	3,010	1,189	—	—	—
Effingham	1	1	—	—	—	—	W	W	W	—	—	—
Fayette	1	1	W	W	—	—	W	W	W	—	—	—
Ford	1	3	W	W	—	—	W	W	W	—	—	—
Fulton	3	3	W	W	—	—	266	415	266	—	—	—
Gallatin	1	1	W	W	—	—	W	W	W	—	—	—
Grundy	1	1	—	—	—	—	W	W	W	—	W	—
Jackson	1	1	W	—	—	—	W	W	W	—	—	—
Jo Daviess	1	1	W	W	—	—	W	W	W	—	—	—
Kane	11	14	2,324	3,915	—	385	6,624	9,907	5,727	—	W	W
Kankakee	3	3	—	—	—	27	27	23	27	—	—	—
Kendall	3	4	W	W	—	—	437	469	437	—	—	—
Lake	7	8	W	224	—	—	1,037	1,409	1,037	—	—	—
La Salle	10	11	W	247	4,485	—	5,123	26,470	3,071	2,052	—	—
Lawrence	3	3	W	W	—	—	669	1,115	669	—	—	—
Lee	3	1	4	4	—	—	8	13	8	—	—	—
Logan	1	4	W	260	—	—	563	1,232	563	—	—	—
McHenry	14	14	1,975	2,186	—	541	4,702	7,592	4,702	—	—	—
McLean	4	4	W	458	—	—	833	2,111	833	—	—	—
Macon	3	3	647	W	—	—	1,008	1,941	1,008	—	—	—
Madison	3	3	W	—	—	—	342	611	342	—	—	—
Marion	1	1	—	W	—	—	6	10	6	—	—	—
Marshall	1	1	W	W	—	—	W	W	W	—	—	—
Mason	1	1	W	—	—	—	W	W	W	—	—	—
Massac	2	2	—	—	—	—	W	W	W	—	—	—
Moultrie	1	1	—	—	— ^b	—	W	W	W	—	—	—
Ogle	2	2	W	W	—	—	W	W	W	—	—	—
Peoria	3	3	W	W	—	—	100	123	100	—	—	—
Platt	2	2	W	W	—	—	W	W	W	—	—	—
Pike	1	1	W	W	—	—	W	W	W	—	—	—
Pulaski	1	1	—	—	—	14	14	9	14	—	—	—
Randolph	1	1	W	—	—	—	W	W	W	—	—	—
Rock Island	1	1	W	W	—	—	W	W	W	—	—	—
St. Clair	1	1	W	W	—	—	W	W	W	—	—	—
Sangamon	5	5	1,386	449	—	—	187	2,022	3,808	2,022	—	—
Schuyler	1	1	W	W	—	—	W	W	W	—	—	—
Shelby	1	1	W	W	—	—	W	W	W	—	—	—
Stark	1	1	—	W	—	—	W	W	W	—	—	—
Stephenson	1	1	W	W	—	—	W	W	W	—	—	—
Tazewell	4	7	447	754	—	37	1,288	3,104	1,288	—	—	—
Union	2	2	W	W	—	—	W	W	W	—	—	—
Vermilion	4	4	W	W	—	85	212	259	212	—	—	—
Wabash	3	3	W	W	—	—	62	155	62	—	—	—
White	3	3	W	W	—	—	280	439	280	—	—	—
Whiteside	3	3	W	W	—	—	218	360	218	—	—	—
Will	6	7	290	1,032	—	171	1,493	3,178	W	W	—	—
Winnebago	6	6	351	134	—	192	677	876	W	W	—	—
Woodford	5	5	283	823	—	117	1,223	2,978	1,223	—	—	—
Concealments			7,656	3,814	—	1,611	6,261	11,581	6,845	224	2,337	181
State total	174	191	15,573	15,309	4,485	3,417	38,784	87,152	33,990	2,276	2,337	181

^aW = withheld included in concealments.^bIndustrial sand production not reported, but a plant was operating in Ogle County.

Source: U.S. Bureau of Mines.

Transportation. The shipment of sand and gravel is restricted largely to areas within a radius of 50 miles from the pit. In 1976, 87.6 percent of total shipments were made by truck. Barge shipments represented 8.6 percent of total shipments, as compared to 7.5 percent in 1975, and rail shipments accounted for 6.7 percent of shipments (table 21).

Consumption and uses. Common sand and gravel produced in Illinois is used primarily in construction aggregates. Of the 34.3 million tons of common sand and gravel produced in 1976, 71.8 percent was used in commercial operations and 28.2 percent in government and contractor operations (table 23). Sand and gravel used in commercial operations decreased by 4.01 percent from the 1975 level, while that used in government and contractor operations increased by 8.18 percent. A total of 11.3 million tons or 32.7 percent was used for building construction; 18.0 million tons, or 52.4 percent, for paving; and 4.6 million tons, or 13.5 percent, as fill (table 23).

Industrial sand produced in 1976 was sold in underground form (95.1 percent of total industrial sand) for use in glass manufacturing; as molding, blasting, grinding, and polishing sand; as engine sand for filtration; and as sand for hydrofracturing in oil wells. Ground sand (4.9 percent of total) was sold for use in chemicals, abrasives, enamels, glass, pottery, porcelain, and tile, and for fillers and foundry purposes.

Stone

Production. Stone production (excluding dimension stone) in Illinois increased by 2.0 percent over the 1975 level (60.6 million tons) to 61.9 million tons in 1976. The total value also rose to \$141.4 million, due not only to the increase in production, but to a rise in the average unit value from \$2.14 per ton in 1975 to \$2.29 per ton in 1976 as well (table 24).

Of the 61.9 million tons of crushed and broken stone produced in 1976, 42.3 million tons were limestone and 19.5 million tons were dolomite. In addition to crushed and broken stone, Illinois produced a small amount of dimension stone (stone quarried and prepared in blocks to specifications) in Kane County. According to the U.S. Bureau of Mines, 4,108 tons of dimension stone valued at \$103,000 was produced in Illinois in 1976.

In 1976, one dimension-stone quarry and 272 limestone or dolomite quarries were operating in Illinois. Fifty-eight counties reported stone production in 1976—11 fewer than in 1975 (fig. 11).

Stone production in Illinois by size of operation is shown in table 25. The number of larger quarries has been increasing for several years, and this trend continued in 1976. The total number of operating stone quarries was greatly reduced in 1976 to 272 from 325 in 1975. Most of this reduction took place at the expense of small quarries—there were only 160 quarries producing less than 100,000 tons per year in 1976 as compared to 208 in 1975. The number of quarries producing between 100,000 and 500,000 tons per year declined to only 83 from 91 in 1975, while the number of quarries producing over 500,000 tons per year increased from 26 in 1975 to 29 in 1976. The increase in size of operation basically reflects the entry of larger companies into the aggregate business. Large companies have sufficient capital to expand an operation and, as a result, can benefit from economies of scale.

Shipment. Shipment of stone, a bulk commodity, is confined primarily to areas near the quarry. Because the hauling distance is short, most stone is shipped by truck. Some producers, in Will and Hardin Counties in particular, are located where they can make good use of the Illinois waterways. In 1976, 87.8 percent or 54.3 million tons of the state's total production (61.9 million tons) were shipped by truck. Other modes of shipment included rail (3.6 million tons) and barge (3.3 million tons) (table 24).

TABLE 22—ILLINOIS SAND AND GRAVEL PRODUCTION, BY SIZE OF OPERATION, 1975 AND 1976

Size of operation (tons per year)	1976			1975		
	Number of operations	Production (1000 tons)	Percentage of total production	Number of operations	Production (1000 tons)	Percentage of total production
Less than 25,000	48	521	1.3	49	596	1.5
25,000 to 49,999	27	953	2.5	33	1,218	3.1
50,000 to 99,999	27	1,895	4.9	29	1,832	4.7
100,000 to 199,999	37	5,312	13.7	42	6,225	16.0
200,000 to 299,999	14	3,328	8.6	12	2,905	7.4
300,000 to 399,999	12	4,146	10.7	15	5,412	13.9
400,000 to 499,999	3	1,350	3.5	4	1,891	4.9
500,000 to 599,999	5	2,738	7.1	4	2,184	5.6
600,000 to 699,999	5	3,272	8.4	2	1,273	3.3
700,000 to 799,999	2	1,453	3.7	3	2,341	6.0
800,000 to 899,999	4	3,430	8.8	3	2,586	6.6
900,000 to 999,999	1	929	2.4	3	2,809	7.2
1,000,000 and over	6	9,457	24.4	5	7,728	19.8
Total	191	38,784	100.0	204	39,000	100.0

Source: U.S. Bureau of Mines.

TABLE 23—ILLINOIS SAND AND GRAVEL SOLD OR USED BY PRODUCER,
BY CLASS OF OPERATION AND USE, 1975 AND 1976

Class of operation and use	1976		1975		Change in quantity from 1975 to 1976 (%)	Change in value from 1975 to 1976 (%)
	Quantity (1000 tons)	Value (\$1000)	Quantity (1000 tons)	Value (\$1000)		
Construction aggregates						
Sand and gravel						
Commercial operations						
Building	10,466	20,829	11,773	20,551	- 11.10	+ 1.35
Paving	10,184	17,281	10,323	18,029	- 1.35	- 4.15
Fill	3,644	5,259	3,289	4,592	+ 10.79	+ 14.53
Other uses ^a	340	578	279	486	+ 21.86	+ 18.93
Total ^b	24,634	43,947	25,664	43,658	- 4.01	+ 0.66
Government and contractor operations						
Building	806	1,517	401	750	+101.00	+102.27
Paving	7,788	14,613	7,472	14,038	+ 4.23	+ 4.10
Fill	984	1,584	986	1,435	- 0.20	+ 10.38
Other uses	88	98	76	82	+ 15.79	+ 19.51
Total ^b	9,666	17,812	8,935	16,305	+ 8.18	+ 9.24
Industrial sand						
Blast	147	890	71	437	+107.04	+103.66
Molding	1,238	6,131	915	5,045	+ 35.30	+ 21.53
Glass	1,939	9,565	2,125	9,619	- 8.75	- 0.56
Other uses ^c	1,160	8,807	1,289	8,450	- 10.01	+ 4.22
Total ^b	4,484	25,393	4,400	23,551	+ 1.91	+ 7.82
Total sand and gravel	38,784	87,152	39,000	83,515	- 0.55	+ 4.35

^aIncludes railroad ballast.

^bNumbers are rounded and totals do not necessarily add up.

^cIncludes engine, filtration, foundry use, grinding and polishing, oil hydrofrac, pottery, abrasives, chemicals, enamel, and other uses.

Source: U.S. Bureau of Mines.

Consumption and uses. Specific uses of stone produced in Illinois are shown in table 26. Stone produced in Illinois is used: (1) for construction aggregate, (2) for agriculture, and (3) for industrial and chemical use (fig. 12).

In 1976, of the 61.9 million tons of stone produced in Illinois, 48.3 million tons (78.2 percent) were used for construction aggregate. Of this total, 35.9 percent (17.3 million tons) was used for road base stone, 21.7 percent (10.4 million tons) for concrete aggregate, 8.1 percent (3.9 million tons) for surface treatment aggregate, 13.9 percent (6.8 million tons) for bituminous aggregate, 7.0 percent (3.4 million tons) for macadam aggregate, and 13.7 percent (6.6 million tons) for unspecified construction aggregate (table 26).

Illinois used 6.8 million tons of stone—chiefly limestone—for agricultural purposes in 1976. This represents 10.9 percent of the total amount of stone produced. In consumption of limestone for agricultural purposes Illinois ranks second, after Missouri, according to the National Lime Association. Primarily to satisfy this large market, Illinois is one of the leading producers of agstone and ground limestone for agricultural purposes.

In 1976, Illinois used 6.7 million tons of stone—or 10.9 percent of the total—for industrial, chemical, and other

uses. High calcium limestone, usually containing more than 95 percent CaO, was used in 1976 in the manufacture of cement and lime, in iron- and steel-making (as fluxstone), in rock-dusting mines, and in various chemical industries.

Dimension stone is not shown in table 26. Approximately 87 percent of the dimension stone produced in Illinois was used as flagstone. The remainder was used as veneer in house construction.

Tripoli (amorphous silica)

Production. The term "tripoli" refers to several fine-grained, porous, siliceous materials mined in four states: tripoli is produced in Arkansas and Oklahoma; amorphous, or soft, silica is mined in Illinois; and rottenstone is produced in Pennsylvania. Illinois has been the nation's largest producer of these siliceous materials in recent years, accounting for about 87 percent of the total United States production in 1976.

During 1976, amorphous silica was produced from two mines in Illinois in Alexander County, by two companies—the Illinois Minerals Company and Tammsco, Inc. The value of prepared material used or sold increased approximately 33.9 percent, while the quantity increased

46.5 percent from 1975 levels. Most of the Illinois production was processed in the state.

Consumption and uses. The amorphous silica processed in Illinois was used mainly for abrasives and filler. From 1975 to 1976, the percentage of finished material increased from 48.0 percent to 60.4 percent, while that sold for filler decreased from 48.3 percent to 35.3 percent.

Metals

Zinc, lead, silver, and germanium

Production. The metals recovered from ore mined in Illinois during 1976—zinc, lead, silver, and germanium—were recovered from fluorspar ore mined in Hardin and Pope Counties by the Allied Chemical Corp. and the Ozark-Mahoning Company.

In 1976, 338,712 tons of fluorspar ore were treated to recover zinc, lead, silver, and germanium. In terms of recoverable metal, zinc production decreased 27.9 percent, lead production decreased 77.4 percent, and silver production decreased 82.3 percent. The value of zinc production decreased 31.6 percent, that of lead 75.7 percent, and that of silver 82.5 percent. Germanium has been produced on and off over the last few years in very small amounts. Production data are not available for germanium, and actual production figures for zinc, lead, and silver are withheld to avoid disclosing individual company data.

Other minerals

Other minerals mined in Illinois include peat, gemstones, and primary barite.

Peat

Although peat is classified as a fuel by the U.S. Bureau of Mines, virtually all commercial sales of peat in the United States (excluding imports) are for agricultural and horticultural purposes—specifically, for soil improvement. Three major kinds of peat—reed-sedge, moss, and peat humus—were produced in Illinois.

In 1976, Illinois ranked third, after Michigan and Indiana, among the 21 peat-producing states and accounted for 8.7 percent of the nation's total peat production. Four companies produced 84,662 tons of peat and five companies sold peat valued at \$763,275 (table 27). Peat production, which decreased 12.1 percent during 1976, came from Whiteside, Kane, Cook, and Lake Counties.

Gemstones

Fluorspar, the gemstone produced in Illinois, contributed very little to the total value of mineral production. The 1976 estimated value of gemstones remained the same as for 1975—approximately \$2,000.

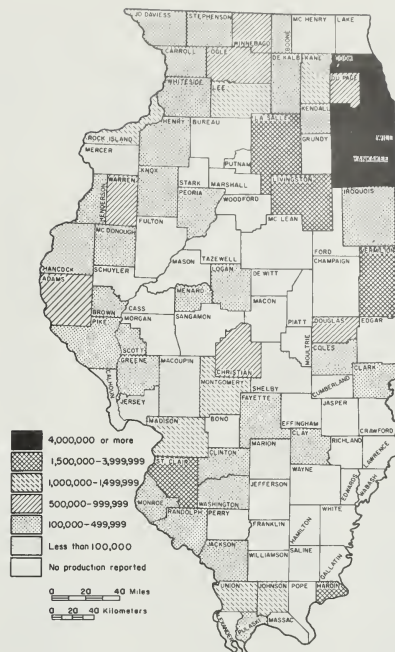


Figure 11. Illinois stone production by county, 1976. Source: U.S. Bureau of Mines.

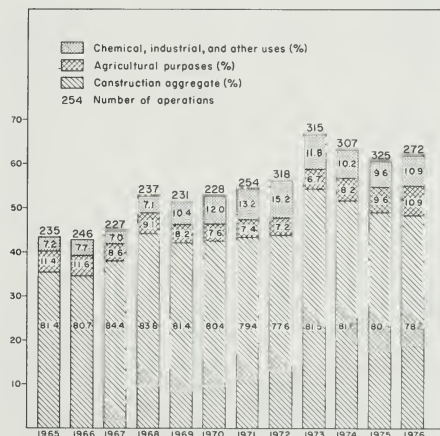


Figure 12. Trends in uses of crushed and broken stone produced in Illinois, 1954-1976.

TABLE 24—PRODUCTION AND VALUE OF ILLINOIS STONE, BY COUNTY
AND MODE OF TRANSPORTATION, 1976

County	Number of quarries	Crushed and broken		Production ^a		Mode of transportation			
		Limestone (tons)	Oolomite (tons)	Tons	Value (\$)	Truck (tons)	Rail (tons)	Barge (tons)	Unspecified (tons)
Adams	9	895,411	—	895,411	5,704,361	505,027	390,384	—	—
Boone	2	W ^b	W	W	W	W	—	—	—
Brown	1	W	—	W	W	W	—	—	—
Calhoun	2	W	—	W	W	W	—	—	—
Carroll	7	285,361	—	285,361	558,783	285,361	—	—	—
Christian	1	W	—	W	W	W	—	—	—
Clark	2	499,505	—	499,505	1,565,775	499,505	—	—	—
Clay	1	W	—	W	W	W	—	—	—
Clinton	2	W	—	W	W	W	—	—	—
Coles	1	486,486	—	486,486	1,631,938	406,486	—	—	—
Cook	6	W	W	14,632,407	30,062,230	13,751,601	870,806	10,000	—
De Kalb	2	W	W	W	W	W	—	—	—
Douglas	2	W	—	W	W	W	—	—	—
Du Page	1	—	W	W	W	W	—	—	—
Fayette	1	265,000	—	265,000	733,378	265,000	—	—	—
Greene	3	370,730	—	370,730	W	370,730	—	—	—
Hancock	3	283,932	—	283,932	681,795	283,932	—	—	—
Hardin	7	2,337,552	—	2,337,552	4,470,842	1,505,494	—	832,058	—
Henderson	3	W	—	W	W	W	—	—	—
Henry	1	W	—	W	W	W	—	—	—
Iroquois	1	W	—	W	W	W	—	—	—
Jackson	1	W	—	W	W	W	—	—	—
Jersey	2	W	—	W	W	W	—	—	—
Jo Daviess	21	W	W	427,541	579,446	427,541	—	—	—
Johnson	2	W	—	W	W	W	W	—	—
Kane	3	1,171,938	—	1,171,938	2,553,181	1,171,938	—	—	—
Kankakee	6	W	W	W	W	W	W	—	—
Kendall	1	—	W	W	W	W	—	—	—
Knox	1	W	—	W	W	W	—	—	—
La Salle	10	2,335,354	—	2,335,354	4,696,612	1,692,948	—	—	642,406
Lee	8	W	W	1,448,647	2,575,323	1,448,647	—	—	—
Livingston	6	2,998,481	—	2,998,481	7,854,039	2,998,481	—	—	—
Logan	1	W	—	W	W	W	—	—	—
McDonough	2	W	—	W	W	W	—	—	—
Macoupin	1	W	—	W	W	W	—	—	—
Madison	3	1,411,565	—	1,411,565	3,572,732	1,411,565	—	—	—
Marion	1	W	—	W	W	W	—	—	—
Menard	2	W	—	W	W	W	—	—	—
Mercer	2	W	—	W	W	W	—	—	—
Monroe	3	493,403	—	493,403	1,342,243	493,403	—	—	—
Montgomery	4	1,394,187	—	1,394,187	3,626,162	1,394,187	—	—	—
Ogle	15	W	W	629,047	1,361,014	629,047	—	—	—
Peoria	1	273,773	—	273,773	711,811	273,773	—	—	—
Pike	6	415,068	—	415,068	943,706	415,068	—	—	—
Pulaski	1	W	—	W	W	W	W	—	—
Randolph	2	W	—	W	W	W	—	—	—
Rock Island	4	1,271,114	—	1,271,114	3,077,724	1,271,114	—	—	—
St. Clair	5	2,675,832	—	2,675,832	5,984,156	2,675,832	—	—	—
Scott	1	W	—	W	W	W	—	—	—
Shelby	1	W	—	W	W	W	—	—	—
Stephenson	10	282,117	—	282,117	W	282,117	—	—	—
Union	3	1,215,865	—	1,215,865	2,950,794	1,215,865	—	—	—
Vermilion	1	W	—	W	W	W	—	—	—
Warren	2	W	—	W	W	W	—	—	—
Washington	3	376,128	—	376,128	1,141,413	376,128	—	—	—
Whiteside	6	W	—	W	W	W	—	—	—
Will	8	W	W	5,618,444	11,293,086	2,786,471	349,093	2,482,880	—
Winnebago	20	W	W	769,577	1,778,660	769,577	—	—	—
Undistributed ^c	45	840,003	—	840,003	1,835,120	840,003	—	—	—
Concealed totals		19,758,561	19,520,900	15,753,797	38,154,304	13,755,944	1,997,853	—	—
Totals	272	42,337,366	19,520,900	61,858,265	141,440,628	54,282,785	3,608,136	3,324,938	642,406

^aExcludes dimension stone.

^bW = withheld to avoid disclosing confidential data of individual companies; included in total.

^cCounty location not reported by producer.

Source: U.S. Bureau of Mines.

TABLE 25—ILLINOIS STONE PRODUCTION BY SIZE OF OPERATION, 1975 AND 1976

Size of Operation (tons per year)	Number of quarries	1976 ^a Production (tons)	Percentage of total	Number of quarries	1975 ^a Production (tons)	Percentage of total
Less than 25,000	109	1,399,400	2.3	156	1,743,945	2.9
25,000 to 49,999	23	825,549	1.3	20	717,773	1.2
50,000 to 74,999	21	1,288,853	2.1	22	1,372,939	2.3
75,000 to 99,999	7	620,839	1.0	10	900,506	1.5
100,000 to 199,999	40	5,774,753	9.3	44	6,294,342	10.4
200,000 to 299,999	20	4,990,633	8.1	25	6,271,346	10.3
300,000 to 399,999	17	5,664,780	9.2	13	4,493,080	7.4
400,000 to 499,999	6	2,672,963	4.3	9	3,944,745	6.5
500,000 to 599,999	5	2,729,144	4.4	4	2,277,667	3.8
600,000 to 699,999	8	5,024,089	8.1	4	2,599,165	4.3
700,000 to 799,999	3	2,384,061	3.9	4	2,986,334	4.9
800,000 to 899,999	1	823,206	1.3	3	2,580,182	4.2
900,000 and over	12	27,659,995	44.7	11	24,454,621	40.3
Total	272	61,858,265	100.0	325	60,636,645	100.0

^aExcludes dimension stone.

Source: U.S. Bureau of Mines.

TABLE 26—USE OF CRUSHED AND BROKEN STONE PRODUCED
IN ILLINOIS, 1976

Use	Limestone (tons)	Oolomite (tons)	Total (tons)	Percentage of total	Percentage of change from 1975	Average value per ton
Road base stone	13,246,447	4,067,853	17,314,300	28.0	- 7.4	2.20
Concrete aggregate	6,920,896	3,524,779	10,445,675	16.9	+ 1.3	2.29
Surface treatment aggregate	2,203,227	1,724,017	3,927,244	6.3	-25.0	2.25
Bituminous aggregate	3,371,352	3,308,058	6,679,410	10.8	+ 5.7	2.28
Unspecified construction	4,441,717	2,171,615	6,613,332	10.7	-21.9	2.15
Agricultural purposes ^a	6,137,184	627,508	6,764,692	10.9	+16.0	2.42
Cement	2,886,557	—	2,886,557	4.7	+20.6	1.73
Macadam aggregate	1,238,410	2,125,819	3,364,229	5.4	—	2.27
Flux stone	^{wbc}	^{wbc}	^{wbc}	—	—	2.16
Riprap & jetty	618,366	160,864	779,230	1.3	+ 0.6	2.28
Railroad ballast	158,516	489,220	647,736	1.0	+62.0	2.04
Other uses ^d	1,114,693	1,321,167	2,435,860	4.0	+28.2	3.40
Total	42,337,365	19,520,900	61,858,265	100.0	+ 2.0	2.29

^aIncludes agricultural limestone and poultry grit.^bW = withheld to avoid disclosing confidential data of individual companies; included in total.^cIncluded with other uses.^dIncludes stone for asphalt filler, chemicals, lime manufacture, mine dusting, filler, roofing aggregate, fill, waste material, whiting, and other uses.

Source: U.S. Bureau of Mines.

TABLE 27—PRODUCTION AND COMMERCIAL SALES OF PEAT
IN ILLINOIS, 1970-1976

Year	Number of plants	Production (tons)	Commercial sales (tons)	Value (\$)	Average value per ton (\$)	Illinois production (%) ^a
1970	6	62,990	63,341	711,000	11.23	12.19
1971	7	72,523	71,823	^{wb}	^w	12.03
1972	5	69,523	74,003	^w	^w	12.06
1973	6	71,552	71,551	1,037,000	14.49	11.28 ^c
1974	6	95,807	95,807	1,412,000	14.74	13.11
1975	6	96,295	95,719	1,511,401	15.79	12.48
1976	4	84,662	87,087	763,000	8.76	8.73

^aIllinois production as percentage of United States production.^bW = withheld to avoid disclosing data from individual companies.^cRevised.

Source: U.S. Bureau of Mines.

Primary barite

Beginning in 1974, primary barite was produced in Illinois in minor amounts as a by-product of the fluorspar industry. In 1976, Allied Chemical Corporation produced barite from its fluorspar operations in Hardin County. Both primary-barite production and its value decreased 28.9 percent from the 1975 levels. Barite is used primarily as a weighting agent in drilling muds, and also in the manufacture of paint, glass, and rubber, and in the production of barium chemicals.

Mineral materials processed

Mineral materials produced mainly in other states and foreign countries but processed in Illinois in 1976 included ground barite, bismuth, columbium and tantalum, calcined gypsum, crude iodine, iron oxide pigments, natural gas liquids, expanded perlite, pig iron, sulfur, exfoliated vermiculite, primary slab zinc, and secondary slab zinc.

Ground barite

In 1976 ground barite was produced in East St. Louis, St. Clair County, by the Mineral Pigments and Metals Division of Pfizer, Inc. The 1976 value was considerably higher than that of 1975, while production increased 50.2 percent from the 1975 level. The ground barite produced in Illinois is used almost exclusively as a filler or extender in paint.

Bismuth

A small quantity of bismuth was recovered by recycling secondary material at the United Refining and Smelting Company, Franklin Park, Cook County. Bismuth is used as a metallurgical additive, in fusible alloys, and in pharmaceutical chemical applications. Production data are not available.

Columbium and tantalum

Processing of columbium-tantalum concentrate imported from foreign countries was reported by Fansteel, Inc. of Chicago. Fansteel produced columbium, tantalum metal, and tantalum carbide. Columbium and tantalum are used primarily in the production of various steel alloys. Production figures are not available.

Calcined gypsum

Gypsum, which is imported from out-of-state mines, was calcined at Waukegan, Lake County, by the National Gypsum Company. In 1976, the quantity of gypsum calcined was 30.4 percent higher than in 1975, and the value was 34.3 percent higher.

Crude iodine

Crude iodine was processed for commercial use at two plants in 1976: Abbott Laboratories in North Chicago, Lake County, and Economics Laboratory, Inc. in Joliet, Will County. Both organic and inorganic compounds were produced. Principal uses for iodine in 1976 included catalysts, stabilizers, animal feed, inks, colorants, pharmaceuticals, and sanitary and industrial disinfectants.

Iron oxide pigments

Illinois plants processed 42,667 tons of iron oxide pigments valued at \$19.3 million in 1976. This represents an increase in both quantity and value from the 1975 levels. The finished pigments were produced from iron ore imported from other states by the Prince Manufacturing Company of Quincy in Adams County; George B. Smith Chemical Works of Maple Park in Kane County; Pfizer, Inc., of East St. Louis in St. Clair County; and Solomon Grinding Service of Springfield in Sangamon County. Pigments produced by these companies included 5,748 tons of natural brown iron oxides valued at \$1.5 million, 15,581 tons of natural red iron oxides valued at \$1.4 million, as well as natural black and yellow iron oxides and synthetic iron oxides. Illinois ranked second in the production of iron oxide pigments in 1976.

Natural gas liquids

Natural gas liquids include ethane, propane, isobutane, unsplit butane, and a combination of gasoline and liquefied petroleum gas (LPG). Natural gas was processed in 1976 in Douglas County at the Tuscola plant of the United States Industrial Chemical Company, a division of National Distillers and Chemical Corporation.

Expanded perlite

Crude perlite mined outside the state was processed by Silbrico Corporation in Cook County; Mica Pellets, Inc., in DeKalb County; Filter Products Corporation (which was purchased by Korhumel Industries, Inc., in November, 1976) National Gypsum Company, both in Lake County; and Johns-Manville Sales Corporation in Will County. Expanded perlite is used primarily as an aggregate for concrete and plaster, for horticultural aggregate, for roof insulating board, for low-temperature insulation, and for aid in filtering. The quantity of expanded perlite produced in 1976 showed a 0.07 percent increase and the value, a 6.0 percent increase from the 1975 levels. Illinois once again led the nation in the processing of expanded perlite.

Pig iron and raw steel

During 1976, 6.4 million tons of pig iron valued at \$1.119.8 million were produced in blast furnaces in Illinois. Production increased by 23.2 percent while the value increased by 23.7 percent from the 1975 levels. Four of the five Illinois steel plants are located in Cook County—Interlake Steel Company, International Harvester Company's Wisconsin Steel Division, United States Steel Corporation, and Republic Steel Corporation. The fifth plant, Granite City Steel Division of National Steel Corporation, is in Madison County. According to the American Iron and Steel Institute, Washington, D.C., 11.0 million tons of raw steel were produced in Illinois in 1976, an increase of 15.5 percent from the 1975 level of 9.6 million tons.

Recovered elemental sulfur

During 1976, elemental sulfur was recovered by six companies operating eight plants: Union Oil Company of California at its Chicago plant in Cook County; Marathon Oil Company at its Robinson refinery in Crawford County; Natural Gas Pipeline Company of America at its St. Elmo plant in Fayette County and at its Herscher plant in Kankakee County; Texaco, Inc., at its Lawrenceville plant in Lawrence County and at its Lockport plant in Will County; Shell Oil Company at its Hartford plant in Madison County; and Mobil Oil Corporation at its Joliet refinery in Will County.

The amount of sulfur recovered in 1976 was 11.2 percent higher than that recovered in 1975 and was valued 19.5 percent higher. Illinois ranked sixth in the nation in quantity of elemental sulfur recovered and seventh in value of shipments. The value of sulfur is included in the total value of mineral products manufactured, to avoid disclosing individual company data on lime.

Exfoliated vermiculite

Crude vermiculite mined outside the state was processed at West Chicago, Du Page County, by the construction Products Division of W. R. Grace and Company; at De Kalb, De Kalb County, by Mica Pellets, Inc.; and at Girard, Macoupin County, by International Vermiculite Company. About 17.9 percent of the total amount of exfoliated vermiculite processed was used for loose-fill insulation, 15.8 percent for block insulation, 10.7 percent for concrete aggregate, and 6.3 percent for horticultural purposes. Fertilizer carrier, plaster aggregates, soil conditioning, and other unspecified uses accounted for the remaining 49.3 percent of the total. The quantity of exfoliated vermiculite processed in 1976 was 18.9 percent higher than in 1975, and the value increased by 37.5 percent.

Primary slab zinc

AMAX, Inc., completed an extensive rehabilitation program at its Sauget, St. Clair County, electrolytic zinc plant during the year. AMAX processed special high-grade zinc from domestic and foreign ores and concentrates again in 1976. Data are not available.

Secondary slab zinc

During 1976, secondary slab zinc was produced by Apex Smelting Company at Chicago, Cook County, and by Sandoval Zinc Company at Sandoval, Marion County. Data are not available.

Mineral products manufactured

The mineral products manufactured in Illinois in 1976 from crude mineral materials mined in Illinois and/or elsewhere included cement, clay products, coke, glass, and lime. Available data on production, consumption, and uses are given below.

Cement

Production. In 1976 in Illinois 1,848,575 tons of finished portland cement and 74,277 tons of prepared masonry cement were manufactured, a 24.9 percent increase in production of portland cement and an 11.7 percent increase in production of masonry cement from 1975. Cement was produced by four companies in Illinois—Centex Corporation at La Salle, La Salle County; Marquette Cement Manufacturing Company at Oglesby, La Salle County; Medusa Corporation at Dixon, Lee County; and Missouri Portland Cement Company at Joppa, Massac County.

Finished portland cement shipments totaling 1,631,812 tons were valued at \$53.5 million, an 18.8 percent increase in quantity and a 25.2 percent increase in value from 1975 levels. Prepared masonry cement shipments totaling 74,385 tons were valued at \$4.4 million, a 7.2 percent increase in quantity and a 19.1 percent increase in value from 1975 levels (table 28).

The raw materials used in the manufacture of cement include cement rock (an argillaceous limestone containing lime, silica, alumina, and magnesia), limestone, clay, shale, sand, fly ash, slag, and gypsum. The total amount of limestone, including cement rock, used in the manufacture of cement was 2,739,281 tons, which means that Illinois was a net exporter of limestone for use in cement in 1976.

Bulk shipments of cement from Illinois plants to customers were made by truck, rail, and barge. Of the total shipment in bulk, 96.8 percent was transported by truck. Container shipments of cement were made only by truck and rail, with 94.0 percent of shipments going by truck.

Consumption. A total of 3,760,000 tons of portland cement was consumed in Illinois in 1976—479,000 tons more than was consumed in 1975 (fig. 13). Only 49.2 percent of the portland cement consumed in Illinois was produced in the state. The other 50.8 percent was imported from other states.

In 1976, Illinois consumed 117,000 tons of masonry cement—16,000 tons more than in 1975 (fig. 14). Of the total consumption of masonry cement in Illinois, 63.5 percent came from Illinois plants. The amount of masonry cement imported into the state has been generally increasing during the past decade.

Clay products

To obtain accurate, current information about the amount and value of clay products manufactured in Illinois, the Illinois State Geological Survey each year sends questionnaires to all producers in the state. Of the twenty-three companies responding to the 1976 canvass, ten reported clay mining operations.

Clay products valued at \$58.0 million were produced in Illinois in 1976. Included are whiteware and pottery (\$19.2 million), structural clay products such as common and face brick, drain tile, and sewer pipes (\$14.8 million), refractories (\$15.0 million), and lightweight aggregate and other products (\$9.0 million).

Coke

Production. In 1976, a total of 1,706,000 tons of coke was produced and 270,000 tons of coke breeze was recovered in Illinois from four oven coke operations—three in Cook County and one in Madison County. Production was down 11.3 percent for coke and up 7.6 percent for breeze from 1975 (table 29). On the basis of an average value of \$94.35 per ton, up \$6.71 per ton from 1975, received by producers for all grades of coke, Illinois coke production in 1976 was worth \$161.0 million, 4.5 percent lower than the 1975 value (table 30). All of the coke produced in 1976, as well as some surplus over and above the amount produced this year, was used in blast furnaces by the producing companies, and some coke was sold from stocks. By-products, other than coke breeze, recovered at Illinois oven-coke plants included coke oven gas, tar, crude light oil, and ammonia.

The coal used for the manufacture of coke in Illinois in 1976 came from Illinois and four other states—Kentucky, West Virginia, Virginia, and Pennsylvania. Illinois contributed 36.1 percent and Kentucky 35.3 percent of the coal carbonized (table 30). Although Arkansas and Oklahoma were both minor suppliers in 1975, they did not ship coal to Illinois for use in coke production in 1976.

Illinois coal used for coking purposes was shipped from mines in Jefferson, Franklin, and Saline Counties only, according to the U.S. Bureau of Mines.

Consumption and uses. Illinois consumed 3,537,000 tons of coke and 319,000 tons of coke breeze in 1976 (table 29), a 13.3 percent increase in coke consumption and a 4.5 percent decrease in breeze consumption from the 1975 levels. Coke is used for the production of pig iron, for foundry and other industrial purposes, and for residential heating. Coke breeze was used for fuel in steam plants, in agglomerating plants, and elsewhere.

Glass

Glass and/or fiberglass was manufactured by companies in Du Page, Lake, La Salle, Logan, McLean, Macon, Madison, Marion, Montgomery, St. Clair, and Will Counties. Production data are not available.

Lime

Production. In 1976, Illinois ranked seventh in the nation in lime production. Hydrated lime and quicklime were produced by two companies, both in Cook County: Marblehead Lime Company, division of General Dynamics, has two plants (at South Chicago and Thornton) and Vulcan Materials Company operates one plant (at McCook). The total amount produced in 1976 was 12.7 percent above the 1975 level, while the value was up 20.4 percent.

Consumption and uses. A total of 1,007,531 tons of lime was consumed in Illinois in 1976, 14.9 percent more than in 1975 (fig. 15). Illinois was one of the leading hydrate-consuming states. The lime was used for steel furnaces, refractories, water purification, sewage treatment, and other purposes. Although Illinois production increased in 1976, consumption also increased to the point where, unlike in 1975, Illinois was a net importer of lime.

REVIEW OF PRELIMINARY MINERAL PRODUCTION DATA FOR 1977

According to the U.S. Bureau of Mines, preliminary figures for 1977 show that Illinois ranked first in the nation in the production of fluor spar, tripoli, and expanded perlite; second in output of crushed stone; and fourth in production of peat and coal.

Coal continued to be the leading mineral commodity in value in 1976, being valued at \$993.0 million, or 64.5 percent of the total \$1,539.7 million total value of mineral materials mined.

Mineral materials mined

Preliminary production data for Illinois indicate that the total value of mineral materials mined reached a record high of \$1,539.7 million—a 6.3 percent increase over the value reported for 1977 (table 31). The increase resulted primarily from an increase in mineral-commodity prices, while in most cases quantities decreased.

TABLE 28—PRODUCTION AND VALUE OF CEMENT MANUFACTURED IN ILLINOIS, 1975 AND 1976

	Finished portland cement			Prepared masonry cement		
	1976	1975	Percentage of change from 1975 to 1976	1976	1975	Percentage of change from 1975 to 1976
Number of active plants	4	4		2	2	
Production (tons)	1,848,575	1,480,628	+ 24.85	74,277	66,508	+ 11.68
Shipment from mills						
Quantity (tons)	1,631,812	1,373,960	+ 18.77	74,385	69,383	+ 7.21
Value	\$53,524,021	\$42,755,837	+ 25.19	\$4,356,444	3,658,146	+ 19.09
Average value per ton	\$32.80	\$31.12	+ 5.40	\$58.57	\$52.72	+ 11.10
Stocks at mills, Dec. 31 (tons)	387,246	155,327	+ 84.93	10,450	10,558	- 1.02

Source: U.S. Bureau of Mines.

TABLE 29—PRODUCTION AND CONSUMPTION OF COKE IN ILLINOIS, BY USE, 1972-1976
(1000 tons)

Year	Coke production	Coke uses (1000 tons)				Total coke consumption ^a	Breeze production	Total breeze consumption
		Blast furnace	Foundry	Other industrial plants	Residential heating			
1972	2,085	2,993	189	16	4	3,201	186	278
1973	1,941	3,610	204	28	1	3,843	223	241
1974	1,912	2,867	213	32	— ^b	3,112	212	365
1975	1,924	2,954	148	19	— ^b	3,122	251	334
1976	1,706	3,356	174	7	— ^b	3,537	270	319

^aData may not add to totals shown because of independent rounding.^bIncluded with "Other industrial plants."

Source: U.S. Bureau of Mines.

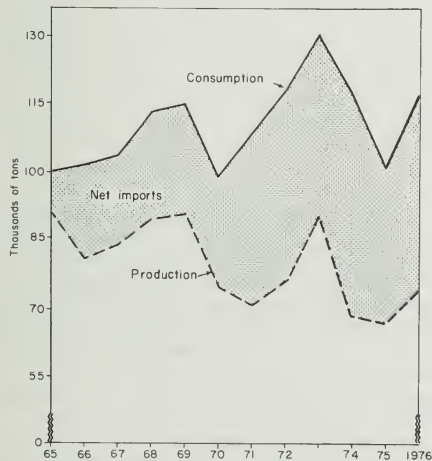


Figure 13. Production and consumption of finished portland cement in Illinois, 1963-1976.

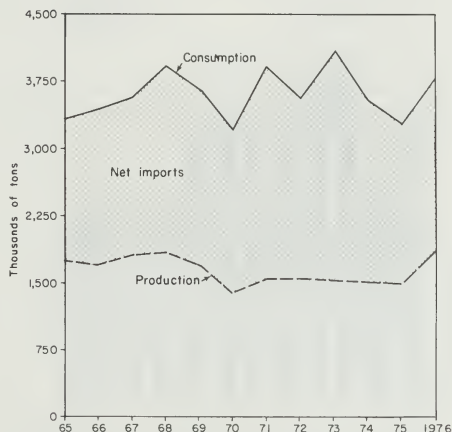


Figure 14. Production and consumption of prepared masonry cement in Illinois, 1963-1976.

TABLE 30—QUANTITY AND VALUE OF COKE AND BY-PRODUCTS PRODUCED, SOLD, OR USED BY PRODUCER IN ILLINOIS, 1975 AND 1976

Coke and by-products	Unit	Quantity	1976		1975		
			Value at plant		Value at plant		
			Total (\$1000)	Average (\$ per ton)	Total (\$1000)	Average (\$ per ton)	
Plants in operation		4			4		
Coal, carbonized	thousand tons	2,771	106,625	38.48	3,087	122,849	39.80
Coal per ton of coke	tons	1.62	—	62.34	1.60	—	63.68
Coke produced	thousand tons	1,706	160,961	94.35	1,924	168,619	87.64
Coke yield, percent of coal carbonized	percent	61.57	—	—	62.33	—	—
Source of coal carbonized							
Illinois	thousand tons	982	—	—	1,038	—	—
Kentucky	thousand tons	960	—	—	1,154	—	—
West Virginia	thousand tons	638	—	—	554	—	—
Pennsylvania	thousand tons	20	—	—	6	—	—
Virginia	thousand tons	122	—	—	92	—	—
Arkansas	thousand tons	—	—	—	209	—	—
Oklahoma	thousand tons	—	—	—	22	—	—
Total	thousand tons	2,722	—	—	3,074	—	—
From stock	thousand tons	49	—	—	13	—	—
Coke sold or used by producer							
Blast furnace	thousand tons	1,751	138,657	—	1,764	129,214	—
Other purposes	thousand tons	W	W	—	W	W	—
Commercial sales							
Blast furnaces	thousand tons	W	W	—	W	W	—
Other industrial plants	thousand tons	—	—	—	—	—	—
Residential	thousand tons	—	—	—	—	—	—
Coke oven by-products							
Ammonia produced (sulfate equivalent)	thousand tons	15	—	—	24	—	—
Per ton of coal coked	lb	11.16	—	—	15.55	—	—
Sulfate equivalent sold	thousand tons	21	874	—	19	1,344	—
Coke oven gas produced	million cu ft	29,204	—	—	30,794	—	—
Per ton of coal	thousand cu ft	10.54	—	—	9.98	—	—
Used in heating coke ovens	million cu ft	12,170	—	—	14,335	—	—
Surplus used or sold	million cu ft	15,455	10,388	0.672/Mcf	13,649	6,592	0.483/Mcf
Wasted	million cu ft	1,578	—	—	2,810	—	—
Light oil and derivatives sold	thousand gal	6,693	—	—	7,008	—	—
Tar produced	thousand gal	16,991	—	—	20,598	—	—
Per ton of coal coked	gal	6.13	—	—	6.67	—	—
Used by producers	thousand gal	W	—	—	W	—	—
Sold for refining	thousand gal	41,678	13,398	0.321/gal	14,699	4,646	0.316/gal
Total coke and by-products sold or used (excluding light oil and derivatives sold)			185,616			181,201	

^aW = withheld to avoid disclosure of data from individual companies.

Source: U.S. Bureau of Mines.

Fuels

Mineral fuels produced during 1977—coal, crude oil, and natural gas—were valued at \$1,271.3 million. Of this amount, 78.1 percent came from coal, 21.8 percent from crude oil, and the remaining 0.1 percent from natural gas. In 1976, the value of mineral fuels produced totaled \$1,193.3 million—6.5 percent lower than the 1977 level.

Coal

Coal production in Illinois dropped again in 1977 to 53.9 million tons from 58.1 million tons in 1976. Coal production declined in most eastern and midwestern

states while production increased in all western coal-mining states. This is due in part to the increased demand for low-sulfur coal from western states. The harsh winter of 1976-77 and the UMW strike which began in December 1977 and had very little effect on the primarily non-union mines in western states, were also contributing factors.

The increased value of Illinois coal production in 1977 is a result of the increase in the average f.o.b. mine price of Illinois coal from \$15.90 per ton in 1976 to \$18.43 per ton in 1977. As a result, the value of coal produced showed a 7.4 percent increase over the 1976 level. Of the total 53.9 million tons produced in Illinois, 29.6 million tons or 54.9 percent came from underground mines, and 24.3 million tons or 45.1 percent came from surface mines.

TABLE 31—PRELIMINARY MINERAL PRODUCTION DATA FOR 1977

Commodity	Unit	1977		1976		Percentage of change from 1976 to 1977	
		Quantity	Value (thousand \$)	Quantity	Value (thousand \$)	Quantity	Value
MINERAL MATERIALS MINED							
Fuels							
Coal	thousand tons	53,880	993,008	58,136	924,365	- 7.32	+ 7.43
Crude oil	thousand bbl	25,824	276,833	26,272	267,450	- 1.71	+ 3.51
Natural gas	thousand Mcf	1,250	1,500	1,556	1,533	-19.67	- 2.12
Industrial and construction materials							
Stone ^a	thousand tons	60,404	145,103	61,858	141,441	- 2.35	+ 2.12
Sand and gravel	thousand tons	42,700	98,800	38,784	87,152	+10.10	+13.37
Clays ^a	thousand tons	964	2,816	1,309	3,272	-26.36	-59.99
Fluorspar	thousand tons	134,277	13,642	142,666	14,563	- 5.88	- 6.32
Tripoli (crude) ^c	thousand tons	W	W	W	W	+ 9.33	+ 6.56
Metals							
Lead	thousand lb	W	W	W	W	+ 1.92	+35.45
Zinc	thousand lb	W	W	W	W	+ 9.45	+ 1.76
Silver	thousand troy ounces	W	W	W	W	+64.16	+74.33
Others							
Peat	thousand tons	88	930	87	763	+ 3.53	+21.89
Gemstones	—	NA ^d	2	NA	2	—	0.00
Barite	tons	W	W	W	W	-57.14	-47.95
Values that cannot be disclosed (W)							
				7,077		8,515	-16.89
Total value of mineral materials mined				1,539,711		1,449,056 ^e	+ 6.26

^aExcludes dimension stone; included with value of items indicated by symbol W. Excludes fuller's earth; included with value of items indicated by symbol W.

^bPreliminary value based on 1975 average unit value.

^cW = withheld to avoid disclosing individual company confidential data.

^dNA = not available.

^eThis amount differs from the total given in Table 1 by the difference between prepared and crude tripoli.

Sources: U.S. Bureau of Mines, Illinois Department of Mines and Minerals, and Oil and Gas Section of the Illinois State Geological Survey.

In 1977, 21 counties reported coal production, one more than in 1976. According to the Illinois Department of Mines and Minerals, 70 coal mines actively operated during 1977, including 45 surface mines and 25 underground mines. The number of persons employed in coal mines increased from 14,731 in 1976 to 16,114 in 1977 (4,739 at surface mines and 11,375 at underground mines), the eighth consecutive year in which employment in Illinois coal mines has increased.

The various consuming sectors and the states to which Illinois coal was shipped in the first nine months of 1977 are shown in tables 32 and 33, respectively.

To meet the projected increase in demand for coal, several new mines are being constructed or planned in Illinois. New mines and expansions to existing mines which have been officially announced as of August 1978 are listed in tables 34 and 35.

Crude oil and natural gas

The production of crude oil in Illinois decreased in 1977 to 25.8 million barrels, 1.7 percent less than the 1976 production. At an average value of \$10.72 per barrel, the 1977 production was valued at \$276.8 million. The

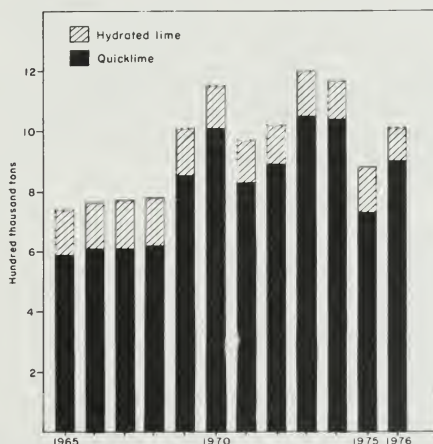


Figure 15. Trends in consumption of quicklime and hydrated lime in Illinois, 1963-1976. Source: U.S. Bureau of Mines.

TABLE 32—COAL SHIPMENTS FROM ILLINOIS TO CONSUMING SECTORS IN THE UNITED STATES, 1976 AND 1977 (1000 unit tons)

Consuming Sector	Jan.-Sept. 1976	Jan.-Sept. 1977	Percentage of change
Electric utilities	36,038	35,229	- 2.24
Coke and gas plants	2,716	2,385	-12.19
Retail dealers	343	165	-51.90
All others	4,105	4,617	+12.47
Railroads	1	—	—
Used at mine	29	25	-13.79
Mine stock (adjusted)	-152	- 87	-42.76
Total	43,080	42,334	- 1.73

Source: U.S. Bureau of Mines Bituminous Coal and Lignite Distribution, January-September, 1976, 1977.

marketed production of natural gas as well as the value continued to decline in 1977 despite the continued increase in demand. Total natural gas marketed was 1,250 million cubic feet—19.7 percent below the 1976 level, and the production was valued at \$1.5 million—2.2 percent less than the 1976 value.

The decrease in natural-gas production can be related to the decline in exploration activity in Illinois in 1977. Footage drilled in new tests was 2,974,206 feet, a decline of 1.9 percent from the 3,031,482 feet drilled in 1976, while the total footage drilled in 1977, 3,326,679 feet, was down 6.8 percent from 1976. There were 1,036 new holes drilled for oil and gas in 46 of the 102 Illinois counties, as compared to 1,257 new holes in 1976. The new holes resulted in 585 oil wells, 20 gas wells, and 431 dry holes.

Salem Limestone production was the highlighted feature of drilling in 1977. Salem production was discovered in ten old fields, and additional Salem producers were drilled in many fields which already had Salem production. The average footage drilled per well was 2,871 feet; six unsuccessful very deep wells, ranging in depth from 6,200 to 8,000 feet, were drilled in 1977. Four new fields, 18 extensions to fields, and 29 new pay zones in fields were discovered in 1977. None of these new discoveries added significantly to Illinois oil and gas reserves.

Industrial and construction materials

Although sand and gravel and tripoli production in Illinois increased significantly in 1977, stone, clay, and fluorspar production decreased. The increase in sand and gravel production is probably related to the increased construction activity in 1977. Aggregate production—the major end use of sand and gravel—was up nationwide. Also, Ottawa Silica, one of the world's leading producers of silica sand, brought its new sand processing plant on stream at its St. Peter Sandstone quarry near Ottawa, La Salle County. The decrease in Illinois stone production, somewhat anomalous in light of the nationwide increase, probably resulted from the closing of several quarries in 1977. Illinois sand and gravel production increased 10.1

TABLE 33—COAL SHIPMENTS FROM ILLINOIS TO CONSUMING STATES, 1976 AND 1977 (1000 unit tons)

Consuming state	Jan.-Sept. 1976	Jan.-Sept. 1977	Percentage of change
Illinois	18,153	16,826	- 7.31
Missouri	9,944	10,362	+ 4.20
Indiana	4,515	5,045	+11.74
Wisconsin	3,472	3,519	+ 1.35
Iowa	2,166	2,286	+ 5.54
Kentucky	1,151	779	-32.32
Minnesota	1,301	1,014	-22.06
Mississippi	381	462	+21.26
Michigan	515	677	+31.46
Georgia-Florida	1,168	1,017	-12.93
Tennessee	381	217	-43.04
Alabama	—	122	—
Other states ^a	-102	- 4	+98.04
Exports (Mexico & Canada)	35	12	-65.71
Total	43,080	42,334	- 1.73

^aIncludes coal used at mines and net change in mine inventory.

Source: U.S. Bureau of Mines Bituminous Coal and Lignite Distribution, January-September, 1976 and 1977.

percent and tripoli production increased 9.3 percent, while stone declined 2.4 percent, clays fell 26.4 percent, and fluorspar decreased 5.9 percent from 1976 levels.

Metals and other minerals

In Illinois in 1977, lead, zinc, barite, and small amounts of silver were recovered as by-products of fluorspar production. The total value of metals mined was 3.3 percent higher than the 1976 value; the value of barite, however, decreased 48.0 percent from the 1976 level.

Illinois peat production in 1977 rose to 88,000 tons and was valued at \$930,000. In 1977 as in 1976, the gemstone mined in Illinois—fluorspar—contributed approximately \$2,000 to the total value of mineral materials mined.

Mineral materials processed

Preliminary data for most mineral materials processed in Illinois in 1977 are not yet available. Figures for natural gas liquids processed are available although they must be withheld to avoid disclosing individual company confidential data. The quantity of natural gas liquids processed declined 0.25 percent, while the value increased by 46.2 percent from the 1976 levels. According to the American Iron & Steel Institute, Illinois raw steel production fell to 10,871,476 tons in 1977, a decline of 1.4 percent from the 1976 level of 11,030,245 tons. The Illinois steel industry produced 7.6 million tons of finished steel, valued at \$310 per ton and 6.2 million tons of pig iron, valued at \$189 per ton. Also in 1977, Illinois producers sold 39,253 tons of iron oxide pigments valued at \$18.1 million—a decline in both quantity and value from the 1976 levels.

TABLE 34—NEW COAL MINES ANNOUNCED OR UNDER CONSTRUCTION IN ILLINOIS
(as of August 1978)

Company and mine name	Location	County	Type of mine ^a	Coal seam	Principal market	Scheduled initial production	Capacity at full operation (million tons)	Status
Amox Coal Co. Crab Orchard	Near Crab Orchard	Williamson	S	Herrin (No. 6)	Steam	1981	1.00	Announced
Unnamed	NA	NA	U	NA	Steam	1982	2.10	Announced
Unnamed	NA	NA	S	NA	Steam	1984	1.10	Announced
Freeman United Coal Crown III	40 miles south of Springfield	Macoupin	U	Herrin (No. 6)	Steam	1981	2.00	Announced
Midwest Mining & Construction	NA	Saline	U	NA				Announced
Morris Coal Inc. Morris #6	NA	Williamson	U	NA	Steam	1978	0.50	Announced
Nicor Inc. and Eastern Associated Coal Corp. Central Illinois		NA	U	Springfield (No. 5)	Steam	1980	2.00	Announced
Peabody Coal Baldwin #3	NA	St. Clair	U	Herrin (No. 6)	Steam	1979	1.30	Announced
Peabody Coal Baldwin #4	NA	St. Clair	U	Herrin (No. 6)	Steam	1980	1.30	Announced
Shell Oil Co. Annex 1	NA	Logan	U	Springfield (No. 5)	Steam	1982	1.85	Announced
Western Fuels Assoc., Inc. Unnamed	NA	Saline & Williamson	U		Steam	1980	1.20	Announced
Zeigler Coal Co. No. 6	Near Murdock	Douglas	U	Herrin (No. 6)	Steam	1979	2.00	Announced

^aS = surface, U = underground.

TABLE 35—EXPANSION OF EXISTING COAL MINES ANNOUNCED IN ILLINOIS
(as of August 1978)

Company and mine name	Location	County	Type of mine ^a	Coal seam	Principal market	Scheduled initial production	Capacity at full operation (million tons)	Status
Amox Coal Co. Delta mine	Near Marion		S	Herrin (No. 6)	Steam	Expansion	2.40	Operating
Sunspot	Near Vermont	Fulton	S	Colchester (No. 2)	Steam	Expansion	1.20	Operating
Wabash	Near Keenesbury	Wabash	U	Harrisburg (No. 5)	Steam	Expansion	3.60	Operating
Inland Steel Coal Co. Inland 2	Near McLeansboro	Hamilton	U	Harrisburg (No. 5)	Metallurgical	Expansion	2.50	Operating
Midland Coal Co. Rapatee Mine	Near Middlegrove	Fulton	S	Springfield (No. 5)	Steam	Expansion	0.70	Operating
Monterey Coal Co. Monterey #2	Near Albers	Clinton	U	Herrin (No. 6)	Steam	Expansion	3.60	Operating
Old Ben Coal Co. No. 25	Near Thompsonville	Franklin	U	Herrin (No. 6)	Steam	Expansion	4.00 ^b	Operating
Zeigler Coal Co. No. 11	Near Sparta	Randolph	U	Herrin (No. 6)	Steam	Expansion	1.50	Operating

^aS = surface, U = underground.

^bCombined capacity of Old Ben Coal Co., No. 25 and No. 27.

Source: Illinois Department of Mines and Minerals and Coal Age, February 1978.

Mineral products manufactured

Mineral products manufactured in Illinois in 1977, for which preliminary data are available, include cement, lime, and coke. Both portland cement (1,834,000 tons) valued at \$63.7 million and masonry cement (108,000 tons) valued at \$6.7 million were produced again in 1977. The amount of lime manufactured was about 2.4 percent less and the value was 8.2 percent higher than in 1976. The quantity of coke manufactured is estimated at 1,596,000 tons—a decline of 6.4 percent from the 1976 level.

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